



**Westinghouse**

**DISPLAY STORAGE TUBE  
Quick Reference Guide**



## FOREWORD

This Quick Reference Guide was compiled in order to provide you, the storage tube user, with a condensed look at the capability and flexibility of the Westinghouse organization.

We have presented data to answer as many as possible of the most asked questions about the performance of Westinghouse storage tubes.

We stand ready with additional published data and an accomplished engineering staff to answer your particular questions and work with you in the development of your specific storage tube application.

## ELECTRICAL AND PERFORMANCE INFORMATION

### Performance Considerations:

The parameters listed below are typical. They should not be construed as a set of absolute performance limitations.

It should be kept in mind that an increase in one aspect of performance can usually be obtained by a decrease in performance in another area, for example, storage time may be increased by reducing display brightness, decreasing writing speed, or increasing erase time.

## SPECIALIZED TYPES

TUBE TYPE	WX-30811	WX-5308	WX-5047	WX-7268A WX-7268B	WX-30154
Outline Drawing	#1	#2	#4	#3	#5
Basing Configuration	8 pin base/ leads	Flying Leads	Flying Leads	25 Pin Base	Flying Leads
Min. Useful Screen Diameter	4"	3"	4"	4"	5.8"
Number of Write Guns	1	1	1	2	1
Type of Focus	ES	ES	ES	ES	ES
Type of Deflection	Magnetic	ES	ES	ES	ES
Minimum Storage Time (Seconds)	30	30	10	15	40
Minimum Writing Speed—in/second	$1 \times 10^5$	$1 \times 10^4$	$4 \times 10^5$	$4 \times 10^4$	$5 \times 10^4$
Maximum Erase Time—Milli-seconds	3	100	50	50	500
Screen Voltage, KV	9.5	8	10	10	10
Min. Brightness, Ft. Lambert	1000	1250	1000	2200	750
Min. Resolution, Lines/in.	100	50	90	70	45
Special Features	Compact High Performance Magnetically Deflected	High Deflection Sensitivity	High Resolution	WX-7268B Is Factory Collimated	Large Viewing Area

## THE HIGH CONTRAST CONCEPT

In the conventional display storage tube, the observer's eye integrates the brief flashes of light that occur during erase pulse on-time to some average level referred to as background brightness. The level of this background brightness is directly proportional to erase pulse duty cycle and inversely proportional to persistence.

High contrast and zero background are achieved by applying to a third grid between the viewing screen and backing electrode, a negative pulse in phase with and of the same character as the positive erase pulse on the backing electrode\*. Typically this "suppressor" grid is operated at a d.c. level of 25 to 75 volts positive with

respect to the flood gun cathode. The negative pulse train must be of sufficient amplitude to drive the suppressor grid slightly negative with respect to the cathode. This negative pulse train prevents flood electrons from reaching the viewing screen during erase pulse on-time resulting in a display with background brightness comparable to that seen in conventional cathode ray tubes.

\* For a more detailed discussion of this principle see U. S. Patent 3,088,048, J. W. Ogland, et al, and "High Contrast Display Storage Tube," Brooke, D. C. and Ingham, F. N., Westinghouse Electric Corporation, Electronic Tube Division technical paper.

## HIGH-CONTRAST TYPES

TUBE TYPE	WX-4951	WX-5444	WX-30593	WX-30808	WX-31016
Outline Drawing	#4	#3	#4	#3	#3
Basing Configuration	Flying Leads	25 Pin Base	14 Pin Base	25 Pin Base	25 Pin Base
Minimum Useful Screen Diameter	4"	4"	4"	4"	4"
Number of Write Guns	1	2	1	2	2
Type of Focus	ES	ES	ES	ES	ES
Type of Deflection	ES	ES	ES	ES	ES
Minimum Storage Time (Seconds)	10	30	30	15	15
Minimum Writing Speed—ln/second	$1 \times 10^5$	$7 \times 10^4$	$1 \times 10^5$	$7 \times 10^4$	$7 \times 10^4$
Maximum Erase Time—Milli-seconds	50	16 (Typ)	10	7	7
Screen Voltage, KV	10	10	10	10	10
Minimum Brightness, Ft. Lamberts	1200	1500	1000	1800	1800
Min. Resolution, Lines/ln.	60	60	60	135 (TV)	70
Special Features		Precision Deflection System	Factory Collimated	High Resolution	Factory Collimated

## MECHANICAL AND ENVIRONMENTAL INFORMATION

### Environmental Capabilities:

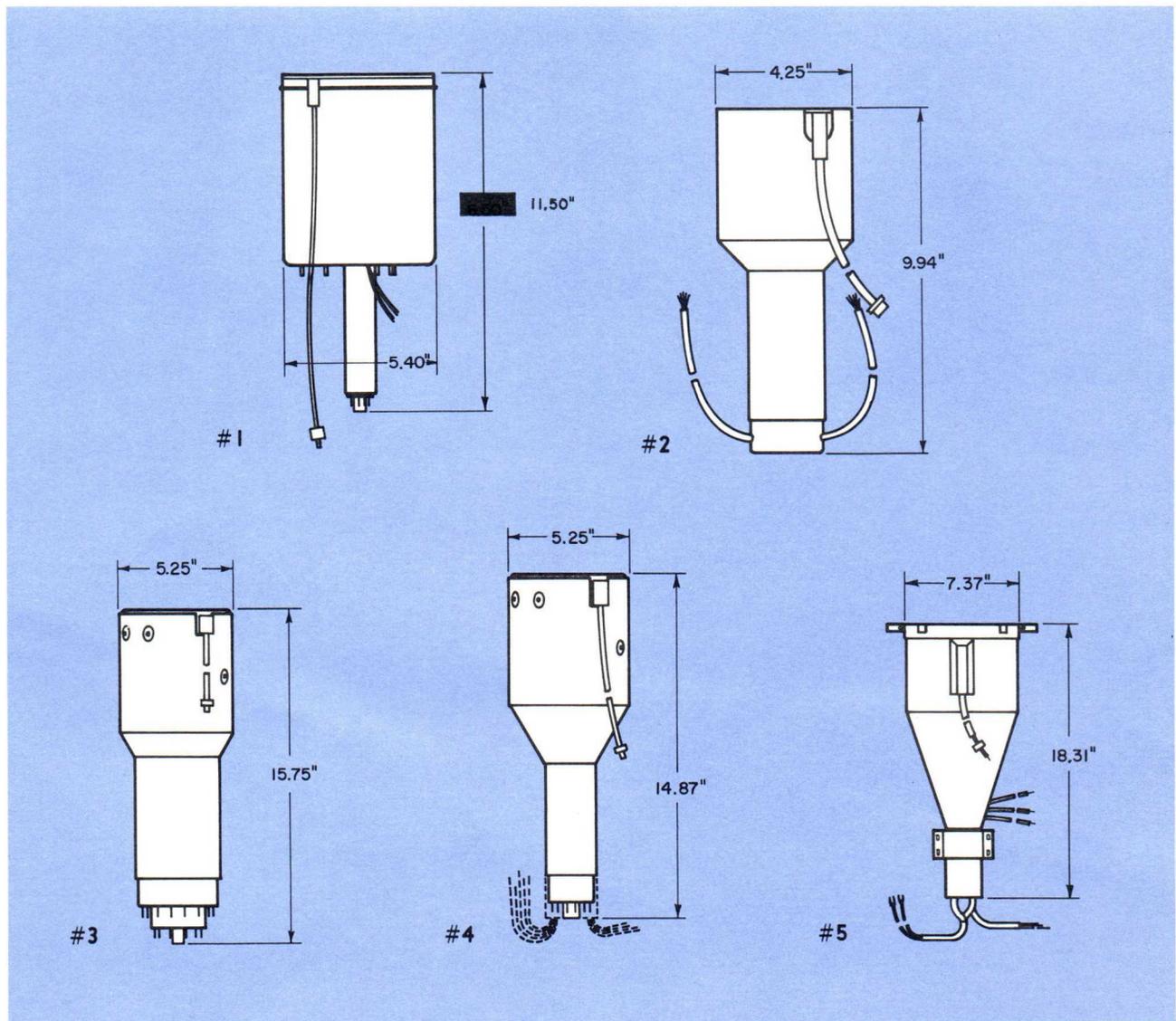
Each Westinghouse direct view storage tube is equipped with an integral magnetic shield which is bonded to the tube through the use of a resilient silicone rubber compound. The resulting protection against shock, vibration, humidity, and electrical leakage has proved invaluable in airborne and mobile applications, where high reliability is required.

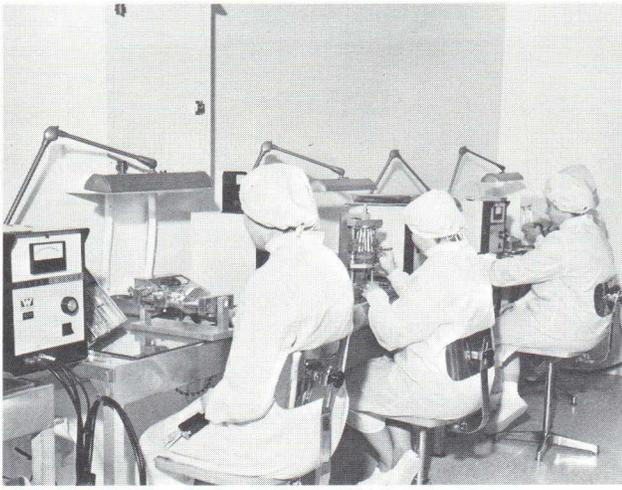
Environmental information is detailed in individual data sheets which are available on request.

### Modifications:

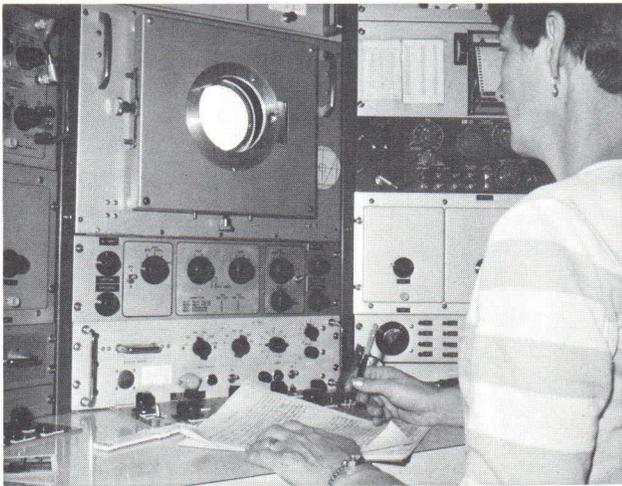
Physical, as well as electrical, modifications can be accomplished in order to satisfy the individual application. For example, "flying leads" can be substituted for JEDEC type basing. A number of phosphors are available. Factory collimation circuitry can be offered in any Westinghouse storage tubes. This eliminates the need for additional external circuitry where maximum simplicity of collimation is desired.

## OUTLINE DRAWINGS

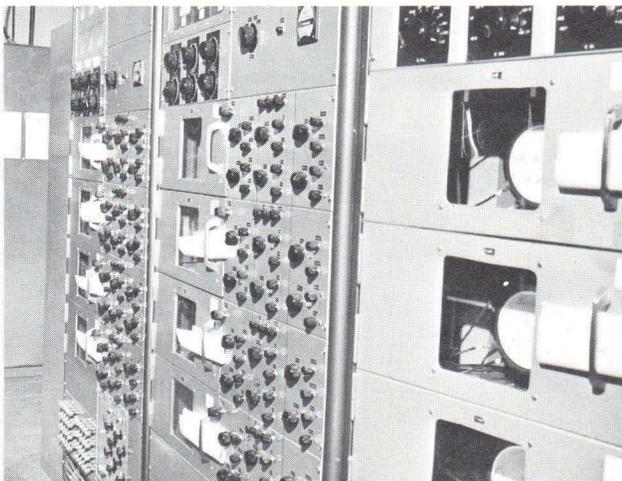




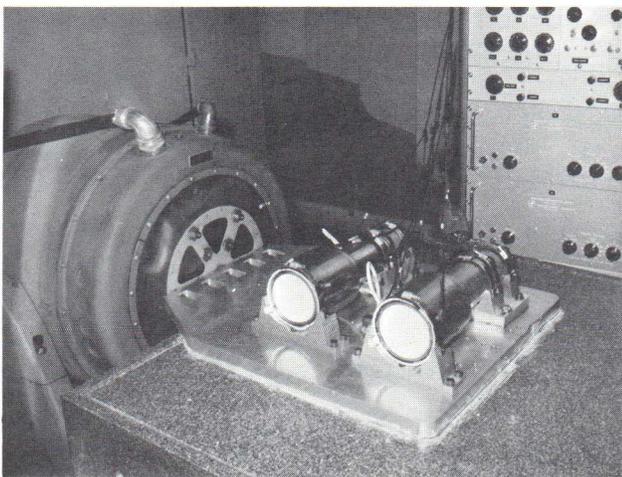
Critical assembly procedures are performed under strict clean room conditions.



Every phase of storage tube performance is thoroughly evaluated and the characteristics of each tube recorded.



Direct view storage tubes are individually tested and aged for 12 to 48 hours. Their "life history" is carefully examined to insure you optimum reliability.



Each direct view storage tube is qualified, on an environmental vibration tester, for military use.

**Sales Offices for Westinghouse Electric International Company**

**Sales Offices for  
Westinghouse Electric International Company**

**Headquarters Location: U. S. A.**

WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY  
200 Park Avenue  
New York, N. Y. 10017  
Phone: (212) 692-3211

**Overseas Locations:**

**England**

WESTINGHOUSE ELECTRIC INTERNATIONAL, S.A.  
1-3 Regent Street  
London, S.W.1, England  
Phone: Whitehall 2704

**Switzerland**

WESTINGHOUSE ELECTRIC INTERNATIONAL, S.A.  
31 rue du Rhone  
Geneva, Switzerland  
Phone: 26-43-73/4/5

**Italy**

WESTINGHOUSE ELECTRIC INTERNATIONAL, S.A.  
Corso Venezia 51  
Milan, Italy  
Phone: 792-558 or 792-910

**Sweden**

WESTINGHOUSE ELECTRIC INTERNATIONAL, S.A.  
Albygatan 123  
Sundbyberg, Sweden  
Phone: Vaxel 08/290360

**West Germany**

WESTINGHOUSE ELECTRIC INTERNATIONAL, S.A.  
Kleine Wiesenau 1  
6 Frankfurt/Main  
Phone: 726-657



**Westinghouse**

Westinghouse Electric Corporation  
Electronic Tube Division  
Elmira, N. Y. 14902

B-9473

File No. 86000 5/68 Litho in U.S.A.  
Supersedes 86-675, 5/65