



A *Iwan W. Sams* PHOTOFAC T PUBLICATION

*Iwan W. Sams*

# TUBE SUBSTITUTION handbook

*COMPLETELY UPDATED & EXPANDED!*  
*Contains Over 1400 NEW Substitutions*

... includes a Brand-New section on Subminiature Tubes

## 6 BIG Sections

- American Receiving Tubes
- Subminiature Tubes
- Industrial Substitutes
- Foreign Substitutes for American Types
- American Substitutes for Foreign Types
- Picture-Tube Substitutes

**NEW**

**VOL.**

**4**

**\$1.50**

**Cat. No. TUB-4**

*Howard W. Sams*

**TUBE  
SUBSTITUTION  
handbook**

by

**The Howard W. Sams Engineering Staff**



**HOWARD W. SAMS & CO., INC.**

**THE BOBBS-MERRILL COMPANY, INC.**

*Indianapolis • New York*

**FIRST EDITION**

**FIRST PRINTING — JUNE, 1960**  
**SECOND PRINTING — JUNE, 1960**  
**THIRD PRINTING — AUGUST, 1960**  
**FOURTH PRINTING — OCTOBER, 1960**  
**FIFTH PRINTING — NOVEMBER, 1960**

**SECOND EDITION**

**FIRST PRINTING — JANUARY, 1961**  
**SECOND PRINTING — MARCH, 1961**  
**THIRD PRINTING — MAY, 1961**

**THIRD EDITION**

**FIRST PRINTING — AUGUST, 1961**  
**SECOND PRINTING — OCTOBER, 1961**  
**THIRD PRINTING — NOVEMBER, 1961**  
**FOURTH PRINTING — JANUARY, 1962**

**FOURTH EDITION**

**FIRST PRINTING — MARCH, 1962**

**TUBE SUBSTITUTION HANDBOOK, VOL. 4**

Copyright © 1962, 1961, and 1960 by Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in the United States of America.

Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. While every precaution has been taken in the preparation of this book, the publisher assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from use of the information contained herein.

Library of Congress Catalog Card Number: 60-13842

## TABLE OF CONTENTS

INTRODUCTION .....	5
--------------------	---

### SECTION 1

Cross Reference of American Receiving Tubes .....	7
---	---

### SECTION 2

Cross Reference of Subminiature Tubes .....	61
---	----

### SECTION 3

Industrial Substitutes For Receiving Tubes .....	70
--	----

### SECTION 4

Foreign Substitutes For American Types .....	74
--	----

### SECTION 5

American Substitutes For Foreign Types .....	83
--	----

### SECTION 6

Picture-Tube Substitutes .....	91
--------------------------------	----

## INTRODUCTION

This revised edition of *Tube Substitution Handbook* includes over 1,400 more substitutes than Volume 3. In addition, an entirely new section, containing a cross reference of subminiature tubes, has been included. Also, the picture-tube section now contains a listing of those tubes requiring odd filament voltages (other than 6.3 volts), or low  $E_{g2}$  potentials. This information can be very useful when setting up your picture-tube testing and rejuvenating equipment.

Although tube substitution should not be performed indiscriminately, there are numerous occasions when it is necessary and feasible. For example, when you don't have the exact tube type with you on a TV service call, you'll either have to take the chassis to the shop (without knowing if a new tube would fix the trouble), or else make a special trip just to get the tube. The same applies if you're working in the shop and need a replacement you don't have—you have to make a special trip to the distributor. Such needless trips waste time and reduce profits.

Also, when a tube is out of production or the distributor does not have it in stock, a substitute is needed. On occasion, too, it is desirable to use an improved version of the tube being replaced. For example, replacing a 6BQ6 with the improved 6CU6 will usually result in better performance.

For your convenience, this handbook is divided into six sections. The first section lists receiving tubes and their substitutes. The second section is a cross reference of subminiature tubes. Section 3 lists receiving tubes which can be replaced with industrial types. (Industrial tubes are more rugged than receiving types in that their peak ratings and power-handling characteristics are much higher: therefore, it may be desirable to substitute an industrial tube to get more satisfactory results.)

Sections 4 and 5 list American and foreign equivalents. If you have an American tube and want to know what foreign type will serve as a substitute, refer to Section 4. If you

have a foreign tube and need to know what American type can be used as a substitute, refer to Section 5. This is a very useful section because of the large amount of foreign-made equipment being sold in this country. (Additional substitutes may be obtained by cross-referencing the American substitutes in this section with listings in Section 1.)

The sixth section lists picture tubes and their substitutes. There are numerous occasions when a picture-tube substitute is necessary: The exact type may be out of production, or it may not be immediately available from the distributor; in either case it is necessary to use a substitute. Also, in custom installations a shorter-necked picture tube may have to be chosen.

For additional information, refer to the introductions to each section. Also pay particular attention to the various notes pertaining to the substitutions.

FEBRUARY, 1962

A handwritten signature in cursive script, reading "Howard W. Sams". The signature is written in dark ink and is positioned to the right of the date.

## Section 1

# CROSS REFERENCE OF AMERICAN RECEIVING TUBES

This section lists *all* American receiving tubes which have been or are being manufactured. Also included are the latest tube types registered with EIA but not yet in production.

To use this listing, locate the tube type to be replaced in the left-hand column. Then refer to the right-hand column for the substitute. The substitutes are only those tubes which have similar, or improved, characteristics and can be inserted directly into the socket. No rewiring or mechanical changes are needed, although the associated service controls may have to be readjusted.

In some instances, the available space around the tube should be considered. For example, although electrically identical to a 6L6GB, a 6L6G is more than one inch taller and a half inch larger in diameter. Thus, the substitution may be physically impossible in some compact equipment.

Do not replace a tube in the right-hand column with one in the left-hand column because this may result in a tube with lesser qualifications being used. For example, where a high heater-to-cathode potential exists, a 6AX4 will hold up, whereas a 6W4 will not. Thus, you'll find the 6AX4 listed as a substitute for the 6W4, but not vice versa.

When no substitutes are shown, none are recommended. Refer to Section 2 to see if an industrial replacement is recommended.

Substitutes marked with an asterisk (\*) should be used only when the filament of the original tube is wired in a parallel circuit, or in a series circuit not requiring controlled warm-up time. Those tubes marked with a section symbol (§) may not work in all circuits.

<i>To Replace</i>	<i>Use</i>
OOA	
O1A	
OA2	
OA3	OA3A, VR75
OA3A	OA3, VR75
OA4G	
OB2	
OB3	OB3A, VR90
OB3A	OB3, VR90
OC2	
OC3	OC3A, VR105
OC3A	OC3, VR105
OD3	OD3A, VR150
OD3A	OD3, VR150
OY4	OY4G
OY4G	OY4
OZ4	OZ4A, OZ4G (may require shield)
OZ4A	OZ4, OZ4G (may require shield)
OZ4G	OZ4, OZ4A
1A3	
1A4	1A4P, 1A4T, 1B4, 1B4P, 1B4T, 951, 32, 34
1A4P	1A4, 1A4T, 1B4, 1B4P, 1B4T, 951, 32, 34
1A4T	1A4, 1A4P, 1B4, 1B4P, 1B4T, 951, 32, 34
1A5G	1A5GT, 1T5GT
1A5GT	1A5G, 1T5GT
1A6	1C6*
1A7G	1A7GT
1A7GT	1A7G
1AB5	
1AB6	1AC6*
1AC6	1AB6*
1AE4	
1AF4	1AJ4, 1AM4, 1T4SF, 1T4*
1AF5	1AH5, 1AR5, 1S5*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
1AH5	1AF5, 1AR5, 1S5*
1AJ4	1AF4, 1AM4, 1T4SF, 1T4*
1AM4	1AF4, 1AJ4, 1T4SF, 1T4*
1AN5	
1AQ5	1R5SF, 1R5*
1AR5	1AF5, 1AH5, 1S5*
1AS5	1U5SF, 1U5*
1AU3	
1AX2	1H2, 1S2A
1B3GT	1AU3, 1G3GT, 1G3GT/1B3GT, 1J3, 1J3A, 1K3, 1N2, 1N2A
1B4	1B4P, 1B4T, 951, 1A4, 1A4P, 1A4T, 32, 34
1B4P	1B4, 1B4T, 32, 951, 1A4, 1A4P, 1A4T, 34
1B4T	1B4, 1B4P, 32, 951, 1A4, 1A4P, 1A4T, 34
1B5	1B5/25S, 25, 25S
1B5/25S	1B5, 25, 25S
1B6	
1B7G	1B7GT
1B7GT	1B7G
1B8GT	1D8GT§
1C3	
1C5G	1C5GT, 1C5GT/G, 1Q5G, 1Q5GT, 1Q5GT/G
1C5GT	1C5G, 1C5GT/G, 1Q5G, 1Q5GT, 1Q5GT/G
1C5GT/G	1C5G, 1C5GT, 1Q5G, 1Q5GT, 1Q5GT/G
1C6	1A6*
1C7G	1D7G*
1D5G	1D5GP, 1D5GT, 1E5G, 1E5GP, 1E5GT
1D5GP	1D5G, 1D5GT, 1E5G, 1E5GP, 1E5GT
1D5GT	1D5G, 1D5GP, 1E5G, 1E5GP, 1E5GT
1D7G	1C7G*
1D8GT	1B8GT§
1DN5	1U5, 1AS5*
1E3	
1E4G	1E4GT

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• RECEIVING TUBES • 1E4GT-1J6GT

<i>To Replace</i>	<i>Use</i>
1E4GT	1E4G
1E5G	1E5GP, 1E5GT, 1D5G, 1D5GP, 1D5GT
1E5GP	1E5G, 1E5GT, 1D5G, 1D5GP, 1D5GT
1E5GT	1E5G, 1E5GP, 1D5G, 1D5GP, 1D5GT
1E7G	1E7GT
1E7GT	1E7G
1F4	
1F5G	
1F6	
1F7G	1F7GH, 1F7GV
1F7GH	1F7G, 1F7GV
1F7GV	1F7G, 1F7GH
1G3GT	1AU3, 1B3GT, 1G3GT/1B3GT, 1J3, 1J3A, 1K3, 1N2, 1N2A
1G3GT/1B3GT	1B3GT, 1G3GT, 1AU3, 1J3, 1J3A, 1K3, 1N2, 1N2A
1G4G	1G4GT, 1G4GT/G
1G4GT	1G4G, 1G4GT/G
1G4GT/G	1G4G, 1G4GT
1G5G	1G5GT, 1J5G
1G5GT	1G5G, 1J5G
1G6G	1G6GT, 1G6GT/G
1G6GT	1G6G, 1G6GT/G
1G6GT/G	1G6G, 1G6GT
1H2	
1H4G	1H4GT
1H4GT	1H4G
1H5G	1H5GT
1H5GT	1H5G
1H6G	1H6GT
1H6GT	1H6G
1J3	1J3A, 1AU3, 1B3GT, 1G3GT, 1G3GT/ 1B3GT, 1K3, 1N2, 1N2A
1J3A	
1J5G	1G5G, 1G5GT
1J6G	1J6GT
1J6GT	1J6G

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
1K3	1AU3, 1B3GT, 1G3GT, 1G3GT/1B3GT, 1J3, 1J3A, 1N2, 1N2A
1K7G	
1L4	
1L6	1U6*
1LA4	1LA4E
1LA4E	1LA4
1LA6	1LC6
1LB4	
1LB6	
1LC5	1LN5
1LC6	1LA6
1LD5	
1LE3	1LF3
1LF3	1LE3
1LG5	
1LH4	
1LN5	1LC5
1M3	1N3
1N2	1N2A, 1AU3
1N2A	1N2, 1AU3
1N3	1M3
1N5G	1N5GT, 1N5GT/G, 1P5G, 1P5GT
1N5GT	1N5G, 1N5GT/G, 1P5G, 1P5GT
1N5GT/G	1N5G, 1N5GT, 1P5G, 1P5GT
1N6G	1N6GT
1N6GT	1N6G
1P5G	1P5GT, 1N5G, 1N5GT, 1N5GT/G
1P5GT	1P5G, 1N5G, 1N5GT, 1N5GT/G
1Q5G	1Q5GT, 1Q5GT/G, 1C5G, 1C5GT, 1C5GT/G
1Q5GT	1Q5G, 1Q5GT/G, 1C5G, 1C5GT, 1C5GT/G
1Q5GT/G	1Q5G, 1Q5GT, 1C5G, 1C5GT, 1C5GT/G
1R4	
1R5	1R5SF*, 1AQ5*
1R5SF	1AQ5, 1R5*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 1S2-2BN4A ●

<i>To Replace</i>	<i>Use</i>
1S2	1S2A, 1H2
1S2A	1S2, 1H2
1S4	
1S5	1AF5*, 1AH5*, 1AR5*
1SA6GT	
1SB6GT	
1T2	
1T4	1AF4*, 1AJ4*, 1AM4*, 1T4SF*
1T4SF	1AF4, 1AJ4, 1AM4, 1T4*
1T5GT	1A5G, 1A5GT
1U4	
1U5	1DN5, 1AS5*
1U5SF	1AS5, 1DN5*, 1U5*
1U6	1L6*
1V	6Z3
1V2	
1V6	
1W4	
1X2	1X2A, 1X2B
1X2A	1X2B
1X2B	
1Z2	
2A3	2A3H
2A3H	2A3
2A5	
2A6	
2A7	2A7S
2A7S	2A7
2AF4	2AF4A, 2AF4B, 2T4§
2AF4A	2AF4B, 2T4§
2AF4B	
2AH2	
2B3	
2B7	2B7S
2B7S	2B7
2BN4	2BN4A
2BN4A	2BN4

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
2CW4	
2CY5	2EA5, 2EV5
2E5	
2EA5	2EV5
2EN5	
2ER5	2ES5, 2FH5, 2FQ5, 2FQ5A, 2FY5
2ES5	2FH5, 2FQ5, 2FQ5A
2EV5	2EA5
2FH5	2ES5, 2FQ5, 2FQ5A
2FQ5	2FQ5A, 2ES5, 2FH5, 2FY5, 2GK5
2FQ5A	2FQ5, 2FH5, 2FY5, 2GK5
2FS5	
2FV6	
2FY5	2FQ5, 2FQ5A, 2GK5
2G5	
2GK5	2FQ5, 2FQ5A, 2FY5
2J2	
2S/4S	
2T4	2AF4§, 2AF4A§, 2AF4B§
2V2	
2V3G	
2W3	2W3GT
2W3GT	2W3
2X2	2X2A, 2Y2
2X2A	2X2, 2Y2
2Y2	2X2, 2X2A
3A2	
3A3	3AW3, 3B2
3A8GT	
3AF4A	3AF4B
3AF4B	
3AJ8	
3AL5	
3AU6	3BA6
3AV6	
3AW3	3A3, 3B2
3B2	3A3, 3AW3

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
3B7	
3BA6	3AU6
3BC5	3CE5
3BE6	3BY6, 3CS6
3BN4	3BN4A
3BN4A	3BN4
3BN6	
3BU8	3GS8
3BX6	3BY7
3BY6	3BE6, 3CS6
3BY7	3BX6
3BZ6	3CB6, 3CF6, 3DK6
3C2	
3C4	3E5, 3V4*
3C5GT	3Q5G, 3Q5GT, 3Q5GT/G
3C6	XXB
3CB6	3BZ6, 3CF6, 3DK6
3CE5	3BC5
3CF6	3BZ6, 3CB6, 3DK6
3CS6	3BE6, 3BY6
3CY5	3EA5, 3EV5
3D6	
3DG4	
3DK6	3BZ6, 3CB6, 3CF6
3DT6	3DT6A
3DT6A	3DT6
3E5	3C4, 3V4*
3E6	
3EA5	3EV5
3EH7	3EJ7
3EJ7	3EH7
3ER5	3ES5, 3FH5, 3FQ5, 3FQ5A, 3FY5
3ES5	3FH5, 3FQ5, 3FQ5A
3EV5	3EA5
3FH5	3ES5, 3FQ5, 3FQ5A
3FQ5	3FQ5A, 3ES5, 3FH5, 3FY5, 3GK5
3FQ5A	3FQ5, 3FH5, 3FY5, 3GK5

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
3FY5	3FQ5, 3FQ5A, 3GK5
3GK5	3FQ5, 3FQ5A, 3FY5
3GS8	3BU8
3LE4	3LF4§
3LF4	3LE4§
3Q4	3S4§, 3S4SF*§
3Q5G	3Q5GT, 3Q5GT/G, 3C5GT
3Q5GT	3Q5G, 3Q5GT/G, 3C5GT
3Q5GT/G	3Q5G, 3Q5GT, 3C5GT
3S4	3S4SF*, 3Q4§
3S4SF	3W4, 3Z4, 3S4*, 3Q4*§
3V4	3C4*, 3E5*
3W4	3S4SF, 3Z4
3Z4	3S4SF, 3W4
4AU6	4BA6
4AV6	
4BA6	4AU6
4BC5	4CE5
4BC8	4BQ7A, 4BS8, 4BX8, 4BZ7, 4BZ8, 5BK7A
4BE6	4CS6
4BL8	5CQ8§, 5EA8§, 5GH8§, 5U8§
4BN4	
4BN6	
4BQ7A	4BC8, 4BS8, 4BX8, 4BZ7, 4BZ8, 5BK7A
4BS8	4BC8, 4BQ7A, 4BX8, 4BZ7, 4BZ8, 5BK7A
4BU8	4GS8, 4HS8
4BX8	4BC8, 4BQ7A, 4BS8, 4BZ7, 4BZ8, 5BK7A
4BZ6	4CB6, 4DE6, 4DK6
4BZ7	4BC8, 4BQ7A, 4BS8, 4BX8, 4BZ8, 5BK7A
4BZ8	4BC8, 4BQ7A, 4BS8, 4BX8, 4BZ7, 5BK7A
4CB6	4BZ6, 4DE6, 4DK6

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 4CE5-5AZ3 ●

<i>To Replace</i>	<i>Use</i>
4CE5	4BC5
4CM4	
4CS6	4BE6
4CX7	
4CY5	
4DE6	4BZ6, 4CB6, 4DK6
4DK6	4BZ6, 4CB6, 4DE6
4DT6	4DT6A
4DT6A	4DT6
4EH7	4EJ7
4EJ7	4EH7
4ES8	
4EW6	4GM6
4FS7	
4GK5	
4GM6	4EW6
4GS8	4BU8, 4HS8
4HS8	4BU8, 4GS8
5AM8	
5AN8	
5AQ5	
5AR4	
5AS4	5AS4A, 5DB4, 5U4GB, 5V3, 5V3A
5AS4A	5AS4, 5DB4, 5U4GB, 5V3, 5V3A
5AS8	
5AT4	
5AT8	5CG8, 5FG7
5AU4	5V3, 5V3A
5AV8	5B8§
5AW4	5AS4, 5AS4A, 5AU4, 5DB4, 5R4GYB, 5U4GA, 5U4GB, 5V3, 5V3A, 5R4G, 5R4GY, 5R4GYA
5AX4GT	5AR4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA
5AZ3	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
5AZ4	5AR4, 5AX4GT, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA, 5Y3G, 5Y3GA, 5Y3GT, 5Y3GT/G, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5B8	5AV8§
5BC3	
5BE8	5BR8§, 5CL8§, 5CL8A§, 5FV8§
5BK7A	4BC8, 4BQ7A, 4BS8, 4BX8, 4BZ7, 4BZ8
5BQ7A	5BS8, 5BZ7
5BR8	5BE8§, 5CL8§, 5CL8A§, 5FV8
5BS8	5BQ7A, 5BZ7
5BT8	
5BW8	
5BZ7	5BQ7A, 5BS8
5CG4	5AR4, 5V4G, 5V4GA, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5CG8	5AT8, 5FG7
5CL8	5CL8A, 5BE8§, 5BR8§, 5FV8§
5CL8A	5CL8, 5BE8§, 5BR8§, 5FV8§
5CM6	5CZ5
5CM8	
5CQ8	5EA8§, 5GH8§, 5U8§
5CR8	
5CU4	
5CZ5	
5DB4	5AS4, 5AS4A, 5U4GB
5DH8	
5DJ4	5DN4
5DN4	5DJ4
5EA8	5GH8, 5U8, 5CQ8§
5EH8	
5ES8	
5EU8	
5EW6	5GM6
5FG7	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
5FV8	5BE8§, 5BR8, 5CL8§, 5CL8A§
5GH8	5EA8, 5U8, 5CQ8§
5GM6	5EW6
5J6	
5R4G	5R4GY, 5R4GYA, 5R4GYB
5R4GY	5R4G, 5R4GYA, 5R4GYB
5R4GYA	5R4G, 5R4GY, 5R4GYB
5R4GYB	
5T4	5AR4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB
5T8	
5U4G	5U4GA, 5U4GB, 5AR4, 5AS4, 5AS4A, 5DB4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4
5U4GA	5U4GB, 5AS4, 5AS4A, 5DB4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB
5U4GB	5AS4, 5AS4A, 5DB4
5U8	5EA8, 5GH8, 5CQ8§
5V3	5V3A, 5AU4
5V3A	
5V4G	5V4GA, 5AR4
5V4GA	5V4G, 5AR4
5V6GT	
5W4	5W4G, 5W4GT, 5W4GT/G, 5AR4, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA, 5Y3G, 5Y3GA, 5Y3GT, 5Y3GT/G, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5W4G	5W4, 5W4GT, 5W4GT/G, 5AR4, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA, 5Y3G, 5Y3GA, 5Y3GT, 5Y3GT/G, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5W4GT	5W4, 5W4G, 5W4GT/G, 5AR4, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA, 5Y3G, 5Y3GA, 5Y3GT, 5Y3GT/G, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
5W4GT/G	5W4, 5W4G, 5W4GT, 5AR4, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA, 5Y3G, 5Y3GA, 5Y3GT, 5Y3GT/G, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5X3	13, 80
5X4G	5X4GA
5X4GA	
5X8	
5Y3G	5Y3GA, 5Y3GT, 5Y3GT/G, 5AR4, 5AX4GT, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4, 5V4GA, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5Y3GA	5Y3G, 5Y3GT, 5Y3GT/G, 5AR4, 5AX4GT, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4, 5V4GA, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5Y3GT	5Y3G, 5Y3GA, 5Y3GT/G, 5AR4, 5AX4GT, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4, 5V4GA, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5Y3GT/G	5Y3G, 5Y3GA, 5Y3GT, 5AR4, 5AX4GT, 5AZ4, 5CG4, 5R4G, 5R4GY, 5R4GYA, 5R4GYB, 5T4, 5V4G, 5V4GA, 5Z4, 5Z4G, 5Z4GT, 5Z4GT/G
5Y4G	5Y4GA, 5Y4GT
5Y4GA	5Y4G, 5Y4GT
5Y4GT	5Y4G, 5Y4GA
5Z3	83
5Z4	5Z4G, 5Z4GT, 5Z4GT/G, 5AR4, 5CG4, 5V4G, 5V4GA
5Z4G	5Z4, 5Z4GT, 5Z4GT/G, 5AR4, 5CG4, 5V4G, 5V4GA
5Z4GT	5Z4, 5Z4G, 5Z4GT/G, 5AR4, 5CG4, 5V4G, 5V4GA
5Z4GT/G	5Z4, 5Z4G, 5Z4GT, 5AR4, 5CG4, 5V4G, 5V4GA

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 6A3-6AF6G ●

<i>To Replace</i>	<i>Use</i>
6A3	
6A4	
6A5G	
6A6	
6A7	6A7S
6A7S	6A7
6A8	6A8G, 6A8GT
6A8G	6A8, 6A8GT
6A8GT	6A8, 6A8G
6AB4	
6AB5	6N5
6AB6G	6N6*, 6N6G*
6AB7	
6AB8	
6AC5G	6AC5GT, 6AC5GT/G
6AC5GT	6AC5G, 6AC5GT/G
6AC5GT/G	6AC5G, 6AC5GT
6AC6G	6AC6GT
6AC6GT	6AC6G
6AC7	6AJ7
6AD5G	6AD5GT
6AD5GT	6AD5G
6AD6G	
6AD7G	
6AD8	6DC8, 6N8
6AE5G	6AE5GT, 6AE5GT/G, 6AF5G
6AE5GT	6AE5G, 6AE5GT/G, 6AF5G
6AE5GT/G	6AE5G, 6AE5GT, 6AF5G
6AE6G	
6AE7G	6AE7GT
6AE7GT	6AE7G
6AE8	
6AF3	
6AF4	6AF4A
6AF4A	6AF4
6AF5G	6AE5G, 6AE5GT, 6AE5GT/G
6AF6G	6AF6GT

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6AF6GT	6AF6G
6AF7G	6CD7*
6AG5	6BC5, 6CE5, 6AK5*, 6CY5*§, 6EA5*§, 6EV5*§
6AG6G	6M6G*
6AG7	6AK7
6AH4GT	
6AH5G	
6AH6	6AH6V
6AH6V	6AH6
6AH7GT	
6AJ4	
6AJ5	
6AJ7	6AC7
6AJ8	
6AK5	6AG5*, 6BC5*, 6CE5*, 6CY5*§, 6EA5*§, 6EV5*§
6AK6	
6AK7	6AG7
6AK8	6T8, 6T8A
6AL3	
6AL5	6EB5
6AL6G	
6AL7	6AL7GT
6AL7GT	6AL7
6AM4	
6AM5	
6AM6	
6AM8	6AM8*, 6HJ8
6AM8A	6AM8*, 6HJ8
6AN4	
6AN5	
6AN6	
6AN7	
6AN8	6AN8A
6AN8A	6AN8*
6AQ4	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 6AQ5-6AW8 ●

<i>To Replace</i>	<i>Use</i>
6AQ5	6AQ5A, 6BM5
6AQ5A	6AQ5*, 6BM5*
6AQ6	6AT6*, 6AV6*, 6BK6*, 6BT6*
6AQ7GT	
6AQ8	6DT8*
6AR5	
6AR6	
6AR7GT	
6AR8	
6AS5	6CA5*
6AS6	6DB6*
6AS7G	6AS7GA, 6080
6AS7GA	6AS7G, 6080
6AS8	
6AS11	
6AT6	6AV6, 6BK6, 6BT6, 6AQ6*
6AT8	6AT8A, 6CG8, 6CG8A, 6FG7
6AT8A	6CG8A, 6FG7, 6AT8*, 6CG8*
6AU4GT	6AU4GTA, 6CQ4*, 6DA4A*, 6DE4*, 6DM4*
6AU4GTA	
6AU5GT	6AV5GA*, 6AV5GT*, 6FW5
6AU6	6AU6A, 6BA6, 7543
6AU6A	6AU6*, 7543*, 6BA6*
6AU7	7AU7
6AU8	6AU8A, 6AW8, 6AW8A, 6BA8, 6BA8A, 6BH8, 6CX8*
6AU8A	6AU8, 6AW8, 6AW8A, 6BA8, 6BA8A, 6BH8, 6CX8*
6AV4	6BX4*
6AV5GA	6AV5GT, 6FW5, 6AU5GT*
6AV5GT	6AV5GA, 6FW5, 6AU5GT*
6AV6	6AT6, 6BK6, 6BT6, 6AQ6*
6AW6	6DC6, 6BH6*
6AW7GT	
6AW8	6AW8A, 6AU8, 6AU8A, 6BA8, 6BA8A, 6EB8*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6AW8A	6AW8, 6AU8, 6AU8A, 6BA8, 6BA8A, 6EB8*
6AX3	
6AX4GT	6AX4GTA, 6AX4GTB, 6DA4, 6DA4A, 6DM4, 6CQ4*, 6DE4*
6AX4GTA	6AX4GTB, 6DA4, 6DA4A, 6DM4, 6CQ4*, 6DE4*
6AX4GTB	6DM4, 6DA4A*
6AX5GT	
6AX6G	
6AX7	
6AX8	6EA8, 6GH8, 6U8, 6U8A, 6CQ8§, 6GJ8*
6AY3	6BH3
6AZ8	
6B3	
6B4G	
6B5	
6B6G	6Q7, 6Q7G, 6Q7GT
6B7	6B7S
6B7S	6B7
6B8	6B8G, 6B8GT
6B8G	6B8, 6B8GT
6B8GT	6B8, 6B8G
6B10	
6BA6	6AU6, 6AU6A, 7543
6BA7	
6BA8	6BA8A, 6AU8, 6AU8A, 6AW8, 6AW8A, 6BH8
6BA8A	6BA8, 6AU8, 6AU8A, 6AW8, 6AW8A, 6BH8
6BC4	
6BC5	6AG5, 6CE5, 6AK5*, 6CY5*§, 6EA5*§, 6EV5*§
6BC7	
6BC8	6BQ7, 6BQ7A, 6BS8, 6BX8, 6BZ7, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6BD4	6BD4A

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6BD4A	
6BD5GT	6AU5GT*, 6AV5GA*, 6AV5GT*, 6FW5*
6BD6	6BA6
6BD7	
6BE6	6BY6, 6CS6
6BE7	
6BE8	6BE8A, 6BR8§, 6BR8A§, 6CL8§, 6CL8A§, 6FV8§, 6FV8A§
6BE8A	6BE8*, 6BR8*§, 6BR8A§, 6CL8§, 6CL8A§, 6FV8§, 6FV8A§
6BF5	
6BF6	6BU6
6BG6G	6BG6GA
6BG6GA	6BG6G
6BH3	
6BH5	
6BH6	6AW6*
6BH8	6AU8, 6AU8A, 6AW8, 6AW8A, 6BA8, 6BA8A
6BJ5	
6BJ6	6BJ6A
6BJ6A	6BJ6
6BJ7	
6BJ8	
6BK4	
6BK5	
6BK6	6AT6, 6AV6, 6BT6, 6AQ6*
6BK7	6BK7A, 6BK7B, X155*, 6BC8*, 6BQ7*, 6BQ7A*, 6BS8*, 6BX8*, 6BZ7*, 6BZ8*
6BK7A	6BK7, 6BK7B, 6BC8*, 6BQ7*, 6BQ7A*, 6BS8*, 6BX8*, 6BZ7*, 6BZ8*, X155*
6BK7B	6BK7*, 6BK7A*, 6BC8*, 6BQ7*, 6BQ7A*, 6BS8*, 6BX8*, 6BZ7*, 6BZ8*, X155*
6BK8	
6BL4	6AU4GTA*, 6CQ4*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
6BL7GT	6BL7GTA, 6BX7GT, 6DN7
6BL7GTA	6BL7GT, 6BX7GT, 6DN7
6BL8	6U8, 6U8A
6BM5	6AQ5, 6AQ5A, 6DL5*, 6DS5*
6BM8	
6BN4	6BN4A
6BN4A	6BN4
6BN5	
6BN6	
6BN7	
6BN8	
6BQ5	7189, 7189A
6BQ6G	6BQ6GA, 6BQ6GT, 6BQ6GTA, 6BQ6GTB, 6BQ6GTB/6CU6, 6CU6, 6DQ6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6BQ6GA	6BQ6G, 6BQ6GT, 6BQ6GTA, 6BQ6GTB, 6BQ6GTB/6CU6, 6CU6, 6DQ6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6BQ6GT	6BQ6G, 6BQ6GA, 6BQ6GTA, 6BQ6GTB, 6BQ6GTB/6CU6, 6CU6, 6DQ6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6BQ6GTA	6BQ6G, 6BQ6GA, 6BQ6GT, 6BQ6GTB, 6BQ6GTB/6CU6, 6CU6, 6DQ6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6BQ6GTB	6BQ6GTB/6CU6, 6CU6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6BQ6GTB/6CU6	6BQ6GTB, 6CU6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6BQ7	6BQ7A, 6BC8, 6BS8, 6BX8, 6BZ7, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6BQ7A	6BQ7, 6BC8, 6BS8, 6BX8, 6BZ7, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6BR5	6DA5
6BR7	
6BR8	6BR8A, 6BE8§, 6BE8A§, 6CL8§, 6CL8A§, 6FV8§, 6FV8A§

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6BR8A	6BR8*, 6BE8*§, 6BE8A§, 6CL8§, 6CL8A§, 6FV8§, 6FV8A§
6BS5	
6BS7	
6BS8	6BC8, 6BQ7, 6BQ7A, 6BX8, 6BZ7, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6BT4	
6BT6	6AT6, 6AV6, 6BK6, 6AQ6*
6BT8	
6BU4	
6BU5	
6BU6	6BF6
6BU8	6GS8, 6HS8
6BV7	
6BV8	
6BW4	
6BW6	
6BW7	6BX6, 6EL7
6BW8	
6BX4	6AV4*
6BX6	6BW7, 6BY7, 6EL7, 6EC7*
6BX7GT	6BL7GT, 6BL7GTA, 6DN7
6BX8	6BC8, 6BQ7, 6BQ7A, 6BS8, 6BZ7, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6BY5G	6BY5GA
6BY5GA	6BY5G
6BY6	6BE6, 6CS6
6BY7	6BX6, 6EC7*
6BY8	
6BZ6	6CB6, 6CB6A, 6CF6, 6DC6, 6DE6, 6DK6
6BZ7	6BC8, 6BQ7, 6BQ7A, 6BS8, 6BX8, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6BZ8	6BC8, 6BQ7, 6BQ7A, 6BS8, 6BX8, 6BZ7, X155, 6BK7*, 6BK7A*, 6BK7B*
6C4	
6C5	6C5G, 6C5GT, 6C5GT/G, 6J5, 6J5G, 6J5GT, 6J5GT/G, 6L5G

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6C5G	6C5, 6C5GT, 6C5GT/G, 6J5, 6J5G, 6J5GT, 6J5GT/G, 6L5G
6C5GT	6C5, 6C5G, 6C5GT/G, 6J5, 6J5G, 6J5GT, 6J5GT/G, 6L5G
6C5GT/G	6C5, 6C5G, 6C5GT, 6J5, 6J5G, 6J5GT, 6J5GT/G, 6L5G
6C6	77, 57AS*
6C7	
6C8G	
6C9	
6C10	
6CA4	
6CA5	6AS5*
6CA7	
6CB5	6CB5A, 6CL5
6CB5A	6CL5
6CB6	6CB6A, 6BZ6, 6CF6, 6DC6, 6DE6, 6DK6, 6HQ6
6CB6A	6CB6*, 6BZ6*, 6CF6*, 6DC6*, 6DE6*, 6DK6*, 6HQ6*
6CD6G	6CD6GA, 6DN6, 6EX6
6CD6GA	6EX6
6CD7	6AF7G*
6CE5	6AG5, 6BC5, 6AK5*, 6CY5*§, 6EA5*§, 6EV5*§
6CF6	6BZ6, 6CB6, 6CB6A, 6DC6, 6DE6, 6DK6
6CG6	
6CG7	6FQ7§
6CG8	6CG8A, 6AT8, 6AT8A, 6FG7
6CG8A	6AT8A, 6FG7, 6CG8*, 6AT8*
6CH6	
6CH7	6CX7
6CH8	
6CJ5	
6CJ6	6DR6
6CK4	
6CK5	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 6CK6-6CX7 ●

<i>To Replace</i>	<i>Use</i>
6CK6	
6CL5	
6CL6	
6CL8	6CL8A, 6BE8A§, 6BR8A§, 6FV8§, 6FV8A§, 6BE8*§, 6BR8*§
6CL8A	6CL8, 6BE8A§, 6BR8A§, 6FV8§, 6FV8A§, 6BE8*§, 6BR8*§
6CM4	
6CM5	
6CM6	6CZ5
6CM7	
6CM8	
6CN6	
6CN7	
6CQ4	
6CQ6	
6CQ8	6EA8§, 6GH8§, 6U8A§, 6U8*§, 6AX8*§, 6GJ8*§
6CR4	
6CR5	
6CR6	
6CR8	
6CS5	6DT5, 6DW5
6CS6	6BE6, 6BY6
6CS7	6DA7*
6CS8	
6CT7	
6CU5	
6CU6	6BQ6GTB, 6BQ6GTB/6CU6, 6DQ6A, 6DQ6B, 6FH6, 6GW6
6CU7	
6CU8	
6CV7	
6CW4	6DS4
6CW5	
6CW7	
6CX7	6CH7

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6CX8	6EB8, 6GN8, 6HF8, 6JE8, 6AU8*, 6AU8A*, 6AW8*, 6AW8A*
6CY5	6EA5, 6EV5, 6AG5*§, 6AK5*§, 6BC5*§, 6CE5*§
6CY7	6DA7*
6CZ5	6DW5*
6D5	6D5G
6D5G	6D5
6D6	78, 58AS*
6D7	
6D8	6D8G
6D8G	6D8
6D10	
6DA4	6DA4A, 6AX4GTA, 6AX4GTB, 6DM4, 6CQ4*, 6DE4*
6DA4A	6CQ4
6DA5	6BR5
6DA6	6DG7*
6DA7	
6DB5	
6DB6	
6DC6	6AW6, 6BZ6, 6CB6, 6CB6A, 6CF6, 6DE6, 6DK6
6DC8	6AD8, 6N8
6DE4	6CQ4, 6DA4A, 6DM4*
6DE6	6BZ6, 6CB6, 6CB6A, 6CF6, 6DC6, 6DK6, 6HQ6
6DE7	6EW7
6DG6GT	6W6GT, 6EF6*, 6EY6*, 6EZ5*
6DG7	
6DJ8	6ES8, 6FW8*
6DK6	6BZ6, 6CB6, 6CB6A, 6CF6, 6DC6, 6DE6, 6HQ6
6DL5	6BM5*
6DL7	
6DM4	6DA4A, 6CQ4*, 6DE4*
6DN6	6CD6G, 6CD6GA, 6EX6

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 6DN7-6EH7 ●

<i>To Replace</i>	<i>Use</i>
6DN7	
6DQ5	
6DQ6	6DQ6A, 6DQ6B, 6FH6, 6GW6
6DQ6A	6DQ6B, 6FH6, 6GW6
6DQ6B	6GW6*
6DR4	
6DR6	6CJ6
6DR7	6FD7, 6FR7
6DR8	
6DS4	6CW4
6DS5	6AQ5*, 6AQ5A*, 6BM5*
6DS8	
6DT5	6EM5*
6DT6	6DT6A
6DT6A	6DT6
6DT8	6AQ8*
6DW5	
6DX8	
6DY5	
6DY7	
6DZ7	
6DZ8	
6E5	
6E6	
6E7	
6E8G	
6EA5	6EV5, 6AG5*§, 6AK5*§, 6BC5*§, 6CE5*§
6EA7	6EM7
6EA8	6GH8, 6U8A, 6AX8*, 6CQ8§, 6GJ8*, 6U8*
6EB5	6AL5
6EB8	6CX8, 6GN8, 6HF8, 6JE8, 6AU8*, 6AU8A*, 6HZ8*
6EC7	6BX6*, 6BY7*
6EF6	6EY6*, 6EZ5*
6EH5	
6EH7	6EJ7

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6EH8	
6EJ7	6EH7
6EL7	6BW7, 6BX6
6EM5	
6EM7	6EA7
6EQ7	
6ER5	6FQ5, 6FQ5A, 6ES5*, 6FH5*, 6FY5*
6ES5	6FH5, 6FY5, 6ER5*, 6FQ5*, 6FQ5A*
6ES6	6ET6
6ES8	6DJ8, 6FW8*
6ET6	6ES6
6ET7	
6EU7	
6EU8	
6EV5	6EA5, 6AG5*§, 6AK5*§, 6BC5*§, 6CE5*§
6EV7	
6EW6	6GM6, 6HQ6*
6EW7	
6EX6	6CD6GA
6EY6	6EZ5
6EZ5	
6EZ8	
6F4	
6F5	6F5G, 6F5GT
6F5G	6F5, 6F5GT
6F5GT	6F5, 6F5G
6F6	6F6G, 6F6GT, 6F6GT/G
6F6G	6F6, 6F6GT, 6F6GT/G
6F6GT	6F6, 6F6G, 6F6GT/G
6F6GT/G	6F6, 6F6G, 6F6GT
6F7	6F7S
6F7S	6F7
6F8G	
6FA7	
6FC7	
6FD6	
6FD7	6FR7

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 6FE5-6GH8 ●

<i>To Replace</i>	<i>Use</i>
6FE5	
6FE8	
6FG5	
6FG6	
6FG7	
6FH5	6ES5, 6ER5*, 6FQ5*, 6FQ5A*
6FH6	6DQ6B, 6GW6
6FH8	
6FJ7	
6FM8	
6FN5	
6FQ5	6FQ5A, 6ER5, 6GK5, 6ES5*, 6FH5*, 6FY5*
6FQ5A	6FQ5, 6ER5, 6GK5, 6FH5*, 6FY5*
6FQ7	
6FR7	6FD7
6FS5	6FG5
6FV6	
6FV8	6FV8A, 6BE8A§, 6BR8A§, 6CL8§, 6CL8A§, 6BE8*§, 6BR8*§
6FV8A	6FV8, 6BE8A§, 6BR8A§, 6CL8§, 6CL8A§, 6BE8*§, 6BR8*§
6FW5	
6FW8	6DJ8*, 6ES8*
6FY5	6FQ5*, 6FQ5A*, 6GK5*
6G5	6G5/6H5, 6H5, 6T5, 6U5/6G5, 6U5
6G5/6H5	6G5, 6H5, 6U5, 6U5/6G5
6G6G	6G6GT
6G6GT	6G6G
6GA8	6CG7*
6GB5	
6GC5	
6GC6	
6GE5	
6GE8	
6GH8	6EA8, 6U8A, 6AX8*, 6CQ8§, 6GJ8*, 6U8*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
6GJ5	
6GJ8	6AX8*, 6EA8*, 6GH8*, 6U8*, 6U8A*, 6CQ8*§
6GK5	6FQ5, 6FQ5A, 6FY5*
6GK6	
6GM5	
6GM6	6EW6, 6HQ6*
6GM8	
6GN6	
6GN8	6CX8, 6EB8, 6HF8, 6JE8, 6AU8*, 6AU8A*, 6AW8*, 6AW8A*, 6HZ8*
6GS8	6BU8, 6HS8
6GT5	
6GW6	6DQ6B
6GW8	
6GX6	6GY6
6GY6	6GX6
6GY8	
6H4	6H4GT
6H4GT	6H4
6H5	6G5, 6G5/6H5, 6T5, 6U5, 6U5/6G5
6H6	6H6G, 6H6GT, 6H6GT/G
6H6G	6H6, 6H6GT, 6H6GT/G
6H6GT	6H6, 6H6G, 6H6GT/G
6H6GT/G	6H6, 6H6G, 6H6GT
6HB6	
6HC8	6BM8*
6HF8	6CX8, 6EB8, 6GN8, 6JE8, 6HZ8*
6HG8	
6HJ8	6AM8*, 6AM8A
6HK8	6BC8, 6BQ7, 6BQ7A, 6BS8, 6BX8, 6BZ7, 6BZ8, X155, 6BK7*, 6BK7A*, 6BK7B*
6HQ6	6CB6, 6CB6A, 6DE6, 6DK6, 6EW6*, 6GM6*
6HS8	6BU8, 6GS8
6HU8	
6HZ8	6EB8*, 6GN8*, 6HF8*, 6JE8*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6J4	
6J5	6J5G, 6J5GT, 6J5GT/G, 6C5, 6C5G, 6C5GT, 6C5GT/G, 6L5G
6J5G	6J5, 6J5GT, 6J5GT/G, 6C5, 6C5G, 6C5GT, 6C5GT/G, 6L5G
6J5GT	6J5, 6J5G, 6J5GT/G, 6C5, 6C5G, 6C5GT, 6C5GT/G, 6L5G
6J5GT/G	6J5, 6J5G, 6J5GT, 6C5, 6C5G, 6C5GT, 6C5GT/G, 6L5G
6J6	6J6A
6J6A	6J6*
6J7	6J7G, 6J7GT
6J7G	6J7, 6J7GT
6J7GT	6J7, 6J7G
6J8G	
6JC8	
6JE8	6EB8, 6GN8, 6HF8, 6HZ8*
6JH8	
6JK8	
6K5G	6K5GT
6K5GT	6K5G
6K6G	6K6GT, 6K6GT/G
6K6GT	6K6G, 6K6GT/G
6K6GT/G	6K6G, 6K6GT
6K7	6K7G, 6K7GT, 6U7G
6K7G	6K7, 6K7GT, 6U7G
6K7GT	6K7, 6K7G, 6U7G
6K8	6K8G, 6K8GT
6K8G	6K8, 6K8GT
6K8GT	6K8, 6K8G
6K11	6Q11
6L5G	6C5, 6C5G, 6C5GT, 6C5GT/G, 6J5, 6J5G, 6J5GT, 6J5GT/G
6L6	6L6G, 6L6GA, 6L6GB, 6L6GC, 5881, 7581, 7581A
6L6G	6L6, 6L6GA, 6L6GB, 6L6GC, 5881, 7581, 7581A

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6L6GA	6L6, 6L6G, 6L6GB, 6L6GC, 5881, 7581, 7581A
6L6GB	6L6, 6L6G, 6L6GA, 6L6GC, 5881, 7581, 7581A
6L6GC	7581, 7581A
6L7	6L7G
6L7G	6L7
6M3	
6M5	
6M6G	6AG6G*
6M7G	
6M8GT	
6N3	6U3
6N4	
6N5	6AB5
6N6	6N6G, 6AB6G*
6N6G	6N6, 6AB6G*
6N7	6N7G, 6N7GT, 6N7GT/G
6N7G	6N7, 6N7GT, 6N7GT/G
6N7GT	6N7, 6N7G, 6N7GT/G
6N7GT/G	6N7, 6N7G, 6N7GT
6N8	6AD8, 6DC8
6P5G	6P5GT, 6P5GT/G
6P5GT	6P5G, 6P5GT/G
6P5GT/G	6P5G, 6P5GT
6P7G	
6Q6	6Q6G
6Q6G	6Q6
6Q7	6Q7G, 6Q7GT, 6B6G
6Q7G	6Q7, 6Q7GT, 6B6G
6Q7GT	6Q7, 6Q7G, 6B6G
6Q11	
6R3	6AF3*
6R6G	
6R7	6R7G, 6R7GT
6R7G	6R7, 6R7GT
6R7GT	6R7, 6R7G

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 6R8-6SN7GTA ●

<i>To Replace</i>	<i>Use</i>
6R8	6T8, 6T8A
6S2	6S2A
6S2A	6S2
6S4	6S4A
6S4A	
6S7	6S7G
6S7G	6S7
6S8GT	
6SA7	6SA7G, 6SA7GT, 6SA7GT/G
6SA7G	6SA7, 6SA7GT, 6SA7GT/G
6SA7GT	6SA7, 6SA7G, 6SA7GT/G
6SA7GT/G	6SA7, 6SA7G, 6SA7GT
6SB7Y	
6SC7	6SC7GT
6SC7GT	6SC7
6SD7GT	6SE7GT
6SE7GT	6SD7GT
6SF5	6SF5GT
6SF5GT	6SF5
6SF7	6SF7GT
6SF7GT	6SF7
6SG7	6SG7GT
6SG7GT	6SG7
6SH7	6SH7GT
6SH7GT	6SH7
6SJ7	6SJ7GT
6SJ7GT	6SJ7
6SK7	6SK7G, 6SK7GT, 6SK7GT/G, 6SS7*, 6SS7GT*
6SK7G	6SK7, 6SK7GT, 6SK7GT/G, 6SS7*, 6SS7GT*
6SK7GT	6SK7, 6SK7G, 6SK7GT/G, 6SS7*, 6SS7GT*
6SK7GT/G	6SK7, 6SK7G, 6SK7GT, 6SS7*, 6SS7GT*
6SL7GT	
6SN7GT	6SN7GTA, 6SN7GTB
6SN7GTA	6SN7GTB

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6SN7GTB	6SN7GTA*
6SQ7	6SQ7G, 6SQ7GT, 6SQ7GT/G, 6SZ7*
6SQ7G	6SQ7, 6SQ7GT, 6SQ7GT/G, 6SZ7*
6SQ7GT	6SQ7, 6SQ7G, 6SQ7GT/G, 6SZ7*
6SQ7GT/G	6SQ7, 6SQ7G, 6SQ7GT, 6SZ7*
6SR7	6SR7GT, 6ST7*
6SR7GT	6SR7, 6ST7*
6SS7	6SS7GT, 6SK7*, 6SK7G*, 6SK7GT*, 6SK7GT/G*
6SS7GT	6SS7, 6SK7*, 6SK7G*, 6SK7GT*, 6SK7GT/G*
6ST7	6SR7*, 6SR7GT*
6SU7	
6SV7	
6SZ7	6SQ7*, 6SQ7G6, 6SQ7GT*, 6SQ7GT/G*
6T4	
6T5	6G5, 6G5/6H5, 6H5, 6U5, 6U5/6G5
6T6	
6T7G	
6T8	6T8A, 6AK8
6T8A	6T8*, 6AK8*
6U3	
6U4GT	6AX4GT, 6AX4GTA, 6AX4GTB, 6DA4, 6DA4A, 6DM4, 6W4GT, 6CQ4*, 6DE4*
6U5	6G5, 6G5/6H5, 6H5, 6T5, 6U5/6G5
6U5/6G5	6U5, 6G5, 6G5/6H5, 6H5, 6T5
6U6GT	6Y6G*, 6Y6GA*, 6Y6GT*
6U7G	6K7, 6K7G, 6K7GT
6U8	6U8A, 6AX8, 6EA8, 6GH8, 6CQ8§, 6GJ8*
6U8A	6U8*, 6EA8, 6GH8, 6AX8*, 6GJ8*, 6CQ8§
6V3	6V3A
6V3A	6V3
6V4	6CA4*
6V5G	6V5GT
6V5GT	6V5G

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6V6	6V6G, 6V6GT, 6V6GTA, 6V6GT/G, 7408
6V6G	6V6, 6V6GT, 6V6GTA, 6V6GT/G, 7408
6V6GT	6V6, 6V6G, 6V6GTA, 6V6GT/G, 7408
6V6GTA	6V6*, 6V6G*, 6V6GT*, 6V6GT/G*, 7408*
6V6GT/G	6V6, 6V6G, 6V6GT, 6V6GTA, 7408
6V7G	
6V8	
6W4GT	6W4GTA, 6AX4GT, 6AX4GTA, 6AX4GTB, 6DA4, 6DA4A, 6DM4, 6U4GT, 6AU4GT*, 6AU4GTA*, 6CQ4*, 6DE4*
6W4GTA	6AX4GTA, 6AX4GTB, 6DA4, 6DA4A, 6DM4, 6AU4GT*, 6AU4GTA*, 6CQ4*, 6DE4*
6W5G	6AX5GT*
6W6GT	6DG6GT, 6EF6*, 6EY6*, 6EZ5*
6W7G	
6X4	6BX4, 6AV4*
6X5	6X5G, 6X5GT, 6X5GT/G, 6AX5*, 6W5G*
6X5G	6X5, 6X5GT, 6X5GT/G, 6AX5* 6W5G*
6X5GT	6X5, 6X5G, 6X5GT/G, 6AX5*, 6W5G*
6X5GT/G	6X5, 6X5G, 6X5GT, 6AX5*, 6W5G*
6X8	6X8A
6X8A	6X8*
6Y3G	
6Y5	6Y5GT, 6Y5V
6Y5V	6Y5, 6Y5GT
6Y5GT	6Y5, 6Y5V
6Y6G	6Y6GA, 6Y6GT, 6U6GT*
6Y6GA	6Y6G, 6Y6GT, 6U6GT*
6Y6GT	6Y6G, 6Y6GA, 6U6GT*
6Y7G	
6Z3	1V
6Z4	84, 84/6Z4
6Z5	12Z5, 6Z5/12Z5
6Z5/12Z5	6Z5, 12Z5

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6Z7G	
6ZY5G	6X5*, 6X5G*, 6X5GT*, 6X5GT/G*
7A4	XXL
7A5	
7A6	
7A7	7B7*
7A8	
7AB7	
7AD7	
7AF7	
7AG7	7AH7, 7G7*
7AH7	7AG7, 7B7, 7L7*
7AJ7	7C7*
7AK7	
7AN7	7EK7
7AU7	6AU7
7B4	
7B5	
7B6	7C6*
7B7	7AH7, 7A7*
7B8	
7C4	
7C5	
7C6	7B6*
7C7	7AJ7*
7D7	
7DJ8	7ES8
7E5	
7E6	
7E7	
7ED7	
7EK7	7AN7
7ES8	7DJ8
7EY6	
7F7	
7F8	
7FC7	7EK7

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 7G7-8ET7 ●

<i>To Replace</i>	<i>Use</i>
7G7	7AG7*
7G8	
7H7	
7HG8	
7J7	
7K7	
7L7	7AH7*
7N7	
7Q7	
7R7	
7S7	
7T7	
7V7	
7W7	
7X6	
7X7	XXFM
7Y4	
7Z4	
8AU8	8AU8A, 8AW8A, 8BA8A, 8BH8
8AU8A	8AU8, 8AW8A, 8BA8A, 8BH8
8AW8A	8AU8, 8AU8A, 8BA8A, 8BH8
8B8	
8BA8A	8AU8, 8AU8A, 8AW8A, 8BH8
8BH8	8AU8, 8AU8A, 8AW8A, 8BA8A
8BN8	
8BQ5	
8BQ7A	
8CG7	8FQ7§
8CM7	
8CN7	
8CS7	
8CW5	
8CX8	8EB8, 8GN8, 8JE8
8CY7	
8EB8	8CX8, 8GN8, 8JE8
8EM5	
8ET7	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
8FQ7	
8GN8	8CX8, 8EB8, 8JE8
8HG8	
8JE8	8CX8, 8EB8, 8GN8
8JK8	
8SN7GTB	
9A8	9U8, 9U8A
9AK8	
9AQ8	
9AU7	
9BM5	
9BR7	
9BR8	9CL8§
9BW6	
9CL8	9BR8§
9DZ8	
9EF6	
9EN7	
9GB8	
9U8	9U8A, 9A8
9U8A	
9X8	
10	210T
10BQ5	
10C8	
10DA7	
10DE7	10EW7
10DR7	10FD7, 10FR7
10EB8	10GN8, 10HF8, 11JE8
10EG7	10EM7
10EM7	10EG7
10EW7	
10FD7	10FR7
10FR7	10FD7
10GN8	10EB8, 10HF8, 11JE8
10HF8	10EB8, 10GN8, 11JE8
11	

§ May not work in all circuits.  
 \* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 11C5-12AT6 ●

<i>To Replace</i>	<i>Use</i>
11C5	12DM5
11CY7	
11JE8	10EB8, 10GN8, 10HF8
12	
12A4	
12A5	
12A6	12A6GT
12A6GT	12A6
12A7	
12A8	12A8G, 12A8GT
12A8G	12A8, 12A8GT
12A8GT	12A8, 12A8G
12AB5	
12AC5	
12AC6	
12AD5	
12AD6	12AG6
12AD7	12AX7*, 12AX7A*, 12BZ7*, 12DF7*, 12DM7*, 12DT7*, 7025*, 7025A*
12AE6	12AE6A, 12FT6
12AE6A	12AE6, 12FT6
12AE7	
12AF3	
12AF6	12BL6, 12EK6§
12AG6	12AD6
12AH6	
12AH7GT	
12AH8	
12AJ6	
12AJ7	
12AL5	
12AL8	
12AQ5	12BM5*
12AS5	12CA5*
12AT6	12AT6A, 12AV6, 12AV6A, 12BK6, 12BT6

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
12AT6A	12AV6A, 12AT6*, 12AV6*, 12BK6*, 12BT6*
12AT7	12AZ7*, 12AZ7A*
12AU6	12AU6A, 12BA6, 12BA6A
12AU6A	12BA6A, 12AU6*, 12BA6*
12AU7	12AU7A
12AU7A	12AU7
12AU8	
12AV5GA	
12AV6	12AV6A, 12AT6, 12AT6A, 12BK6, 12BT6
12AV6A	12AT6A, 12AV6*, 12AT6*, 12BK6*, 12BT6*
12AV7	
12AW6	
12AX4GT	12AX4GTA, 12AX4GTB, 12D4, 12D4A, 12DM4
12AX4GTA	12AX4GTB, 12D4, 12D4A, 12DM4, 12AX4GT*
12AX4GTB	12D4A, 12DM4
12AX7	12AX7A, 12DF7, 12DT7, 7025, 7025A, 12AD7*, 12BZ7*, 12DM7*
12AX7A	12AX7, 12DF7, 12DT7, 7025, 7025A, 12AD7*, 12BZ7*, 12DM7*
12AY3	
12AY7	
12AZ7	12AZ7A, 12AT7*
12AZ7A	12AZ7*, 12AT7*
12B3	
12B4	12B4A
12B4A	12B4*
12B7	14A7, 14H7
12B8GT	
12BA6	12BA6A, 12AU6, 12AU6A
12BA6A	12AU6A, 12AU6*, 12BA6*
12BA7	
12BD6	12BA6, 12BA6A

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
12BE6	12BE6A, 12CS6
12BE6A	12BE6*, 12CS6*
12BF6	12BU6
12BH7	12BH7A
12BH7A	12BH7*
12BK5	
12BK6	12AT6, 12AT6A, 12AV6, 12AV6A, 12BT6
12BL6	12AF6, 12EK6§
12BM5	12AQ5*
12BN6	12BN6A
12BN6A	12BN6*
12BQ6GA	12BQ6GTA, 12BQ6GTB, 12BQ6GTB/ 12CU6, 12CU6, 12DQ6, 12DQ6A, 12DQ6B, 12GW6
12BQ6GT	12BQ6GA, 12BQ6GTA, 12BQ6GTB, 12BQ6GTB/12CU6, 12CU6, 12DQ6, 12DQ6A, 12DQ6B, 12GW6
12BQ6GTA	12BQ6GTB, 12BQ6GTB/12CU6, 12CU6, 12DQ6, 12DQ6A, 12DQ6B, 12GW6
12BQ6GTB	12BQ6GTB/12CU6, 12CU6, 12DQ6A, 12DQ6B, 12GW6
12BQ6GTB/ 12CU6	12BQ6GTB, 12CU6, 12DQ6A, 12DQ6B, 12GW6
12BR7	12BR7A
12BR7A	12BR7*
12BT6	12AT6, 12AT6A, 12AV6, 12AV6A, 12BK6
12BU6	12BF6
12BV7	12BY7, 12BY7A, 12DQ7
12BW4	
12BX6	13EC7*
12BY7	12BY7A, 12BV7, 12DQ7
12BY7A	12BY7*, 12DQ7, 12BV7*
12BZ6	
12BZ7	
12C5	12C5/12CU5, 12CU5, 12R5, 12DM5*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
12C5/12CU5	12C5, 12CU5, 12R5, 12DM5*
12C8	
12CA5	12EH5, 12AS5, 12ED5*
12CM6	
12CN5	
12CR5	
12CR6	
12CS5	12DT5, 12DW5
12CS6	12BE6, 12BE6A
12CT8	
12CU5	12C5, 12C5/12CU5, 12R5, 12DM5*
12CU6	12BQ6GTB, 12BQ6GTB/12CU6, 12DQ6A, 12DQ6B, 12GW6
12CX6	12EZ6
12CY6	
12D4	12D4A, 12AX4GTB, 12DM4
12D4A	12DM4
12DB5	
12DE8	
12DF5	
12DF7	12AX7, 12AX7A, 12DT7, 7025, 7025A, 12AD7*, 12BZ7*, 12DM7*
12DK5	
12DK7	
12DL8	
12DM4	12D4A
12DM5	11C5, 12C5*, 12C5/12CU5*, 12CU5*, 12R5*
12DM7	12AD7*, 12AX7*, 12AX7A*, 12BZ7*, 12DF7*, 12DT7*, 7025*, 7025A*
12DQ6	12DQ6A, 12DQ6B, 12GW6
12DQ6A	12DQ6B, 12GW6
12DQ6B	12GW6
12DQ7	12BY7A, 12BY7*, 12BV7*
12DS7	12DS7A
12DS7A	12DS7
12DT5	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• RECEIVING TUBES 12DT6-12FX8A •

<i>To Replace</i>	<i>Use</i>
12DT6	
12DT7	12AX7, 12AX7A, 12DF7, 7025, 7025A, 12AD7*, 12BZ7*, 12DM7*
12DT8	
12DU7	
12DV7	
12DV8	
12DW5	
12DW7	7247
12DW8	
12DY8	
12DZ6	12EA6, 12EK6
12DZ8	
12E5GT	
12EA6	12DZ6, 12EK6
12EC8	
12ED5	12CA5*, 12EH5*
12EF6	
12EG6	
12EH5	12CA5, 12ED5*
12EK6	12DZ6, 12EA6
12EL6	
12EM6	
12EN6	12L6GT, 12W6GT
12EQ7	
12EZ6	12CX6
12F5GT	
12F8	
12FA6	
12FB5	
12FK6	12FM6
12FM6	12FK6
12FQ8	
12FR8	
12FT6	12AE6, 12AE6A
12FX8	12FX8A
12FX8A	12FX8

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
12G4	
12G8	
12GA6	
12GC6	
12GJ5	
12GN6	
12GT5	
12GW6	12DQ6B
12H4	
12H6	
12HU8	
12J5	12J5GT
12J5GT	12J5
12J7	12J7G, 12J7GT
12J7G	12J7, 12J7GT
12J7GT	12J7, 12J7G
12J8	
12K5	
12K7G	12K7GT
12K7GT	12K7G
12K8	12K8GT
12K8GT	12K8
12L6GT	12EN6, 12W6GT
12L8GT	
12Q7	12Q7G, 12Q7GT
12Q7G	12Q7, 12Q7GT
12Q7GT	12Q7, 12Q7G
12R5	
12S7	
12S8	12S8GT
12S8GT	12S8
12SA7	12SA7G, 12SA7GT, 12SA7GT/G, 12SY7, 12SY7GT
12SA7G	12SA7, 12SA7GT, 12SA7GT/G, 12SY7 12SY7GT
12SA7GT	12SA7, 12SA7G, 12SA7GT/G, 12SY7, 12SY7GT

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
12SA7GT/G	12SA7, 12SA7G, 12SA7GT, 12SY7, 12SY7GT
12SC7	
12SF5	12SF5GT
12SF5GT	12SF5
12SF7	12SF7GT
12SF7GT	12SF7
12SG7	
12SH7	12SH7GT
12SH7GT	12SH7
12SJ7	12SJ7GT
12SJ7GT	12SJ7
12SK7	12SK7GT, 12SK7GT/G
12SK7GT	12SK7, 12SK7GT/G
12SK7GT/G	12SK7, 12SK7GT
12SL7GT	
12SN7GT	12SN7GTA, 12SX7GT
12SN7GTA	
12SQ7	12SQ7GT, 12SQ7GT/G
12SQ7GT	12SQ7, 12SQ7GT/G
12SQ7GT/G	12SQ7, 12SQ7GT
12SR7	12SR7GT, 12SW7
12SR7GT	12SR7, 12SW7
12SW7	12SR7, 12SR7GT
12SX7GT	12SN7GT, 12SN7GTA
12SY7	12SY7GT, 12SA7, 12SA7G, 12SA7GT, 12SA7GT/G
12SY7GT	12SY7, 12SA7, 12SA7G, 12SA7GT, 12SA7GT/G
12U7	
12V6GT	
12W6GT	12EN6, 12L6GT
12X3	
12X4	
12Z3	14Z3
12Z5	6Z5, 6Z5/12Z5
13	5X3, 80

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
13CM5	
13DE7	
13DR7	13FD7, 13FR7
13EC7	12BX6*
13EM7	15EA7
13FD7	13FR7
13FR7	13FD7
13GC8	
14A4	
14A5	
14A7	12B7, 14H7
14AF7	XXD
14B6	
14B8	
14C5	
14C7	
14DA7	
14E6	
14E7	
14F7	
14F8	
14G6	
14GT8	14GT8A, 14JG8
14GT8A	
14H7	12B7, 14A7
14J7	14S7
14JG8	14GT8, 14GT8A
14K7	
14L7	
14N7	
14Q7	
14R7	
14S7	14J7
14V7	
14W7	
14X7	
14Y4	

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 14Y7-17GJ5 ●

<i>To Replace</i>	<i>Use</i>
14Y7	
14Z3	12Z3
15	
15A6	
15A8	
15CW5	
15DQ8	
15EA7	13EM7
15EW6	
16	16B, 81
16A5	
16A8	
16AQ3	
16B	16, 81
16GK6	
16GK8	
17AV5GA	
17AX4GT	17AX4GTA, 17D4, 17D4A, 17DM4
17AX4GTA	17D4, 17D4A, 17DM4
17AY3	
17BH3	
17BQ6GTB	17DQ6A, 17DQ6B, 17GW6
17C5	17CU5, 17R5
17C8	
17C9	17C9A
17C9A	17C9*
17CA5	
17CU5	17C5, 17R5
17D4	17D4A, 17AX4GTA, 17DM4
17D4A	17DM4
17DE4	
17DM4	17D4A
17DQ6	17DQ6A, 17DQ6B, 17GW6
17DQ6A	17DQ6B, 17GW6
17DQ6B	17GW6
17EW8	
17GJ5	

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
17GT5	
17GW6	17DQ6B
17H3	
17HC8	
17JK8	
17L6GT	17W6GT
17R5	
17W6GT	17L6GT
17Z3	
18	
18A5	
18DZ8	
18FW6	18FW6A, 18GD6, 18GD6A
18FW6A	18GD6A, 18FW6*, 18GD6*
18FX6	18FX6A
18FX6A	18FX6*
18FY6	18FY6A, 18GE6, 18GE6A
18FY6A	18GE6A, 18FY6*, 18GE6*
18GD6	18GD6A, 18FW6, 18FW6A
18GD6A	18FW6A, 18GD6*, 18FW6*
18GE6	18GE6A, 18FY6, 18FY6A
18GE6A	18FY6A, 18GE6*, 18FY6*
18HB8	
19	
19AQ5	
19AU4	19AU4GT, 19AU4GTA, 17DE4
19AU4GT	19AU4, 19AU4GTA, 17DE4
19AU4GTA	
19BG6G	19BG6GA
19BG6GA	19BG6G
19C8	19T8, 19T8A
19CL8A	19CL8B, 19JN8
19CL8B	19CL8A*, 19JN8*
19CS4	
19D8	
19DE7	
19EA8	19EA8A

§ May not work in all circuits.  
 \* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● 19EA8A-25AV5GT ● RECEIVING TUBES

<i>To Replace</i>	<i>Use</i>
19EA8A	19EA8*
19EZ8	
19HV8	
19J6	
19JN8	19CL8A, 19CL8B
19T8	19T8A, 19C8
19T8A	19T8*, 19C8*
19V8	
19X3	
19X8	
19Y3	19X3
20	
20EQ7	
20EZ7	
20J8	
21A6	21B6
21A7	
21B6	21A6
21EX6	25CD6GB
22	
22BH3	
22DE4	
24A	24S
24S	24A
25	25S, 1B5, 1B5/25S
25A6	25A6G, 25A6GT, 25A6GT/G
25A6G	25A6, 25A6GT, 25A6GT/G
25A6GT	25A6, 25A6G, 25A6GT/G
25A6GT/G	25A6, 25A6G, 25A6GT
25A7G	25A7GT, 25A7GT/G
25A7GT	25A7G, 25A7GT/G
25A7GT/G	25A7G, 25A7GT
25AC5G	25AC5GT, 25AC5GT/G
25AC5GT	25AC5G, 25AC5GT/G
25AC5GT/G	25AC5G, 25AC5GT
25AV5GA	25AV5GT
25AV5GT	25AV5GA

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
25AX4GT	25D4
25B5	
25B6G	
25B8	25B8GT
25B8GT	25B8
25BK5	
25BQ6GA	25BQ6GTB, 25BQ6GTB/25CU6, 25CU6, 25DQ6, 25DQ6A
25BQ6GT	25BQ6GA, 25BQ6GTB, 25BQ6GTB/ 25CU6, 25CU6, 25DQ6, 25DQ6A
25BQ6GTB	25BQ6GTB/25CU6, 25CU6, 25DQ6A
25BQ6GTB/ 25CU6	25BQ6GTB, 25CU6, 25DQ6A
25C5	
25C6G	25C6GA
25C6GA	25C6G
25CA5	25EH5
25CD6G	25CD6GA, 25CD6GB, 25DN6, 21EX6
25CD6GA	25CD6GB, 25DN6, 21EX6
25CD6GB	21EX6
25CR5	
25CU6	25BQ6GTB, 25BQ6GTB/25CU6, 25DQ6A
25D4	
25D8GT	
25DK4	
25DN6	25CD6GB, 21EX6
25DQ6	25DQ6A
25DQ6A	
25DT5	
25E5	
25EC6	25CD6GB, 21EX6
25EH5	25CA5
25F5	
25GF6	
25L6	25L6G, 25L6GT, 25L6GT/G, 25W6GT
25L6G	25L6, 25L6GT, 25L6GT/G, 25W6GT
25L6GT	25L6, 25L6G, 25L6GT/G, 25W6GT

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 25L6GT/G-30AE3 ●

<i>To Replace</i>	<i>Use</i>
25L6GT/G	25L6, 25L6G, 25L6GT, 25W6GT
25N6	25N6G
25N6G	25N6
25S	25, 1B5, 1B5/25S
25U4GT	25AX4GT, 25D4, 25W4GT
25W4GT	25AX4GT, 25D4, 25U4GT
25W6GT	25L6, 25L6G, 25L6GT, 25L6GT/G
25X6GT	
25Y4GT	
25Y5	25Z5
25Z3	
25Z4	25Z4GT
25Z4GT	25Z4
25Z5	25Y5
25Z6	25Z6G, 25Z6GT, 25Z6GT/G
25Z6G	25Z6, 25Z6GT, 25Z6GT/G
25Z6GT	25Z6, 25Z6G, 25Z6GT/G
25Z6GT/G	25Z6, 25Z6G, 25Z6GT
26	
26A6	26CG6
26A7	26A7GT
26A7GT	26A7
26BK6	
26C6	
26CG6	26A6
26D6	
26E6G	
26Z5	
27	27S, 56, 56S
27GB5	28GB5
27S	27, 56, 56S
28D7	
28GB5	27GB5
28Z5	
30	
30A5	
30AE3	

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
31	
31A3	
32	1B4P, 1B4T, 951
32A8	
32ET5	32ET5A, 34GD5, 34GD5A
32ET5A	34GD5A
32L7GT	
33	
34	
34GD5	34GD5A, 32ET5, 32ET5A
34GD5A	32ET5A
35	35S, 35/51, 35S/51S, 51, 51S
35/51	35, 35S/51S, 51, 35S, 51S
35A3	
35A5	
35B5	
35C3	35A3
35C5	35C5A
35C5A	
35CD6GA	
35D5	
35DZ8	
35EH5	35EH5A
35EH5A	
35FN5	
35GL6	
35HB8	
35L6G	35L6GT, 35L6GT/G
35L6GT	35L6G, 35L6GT/G
35L6GT/G	35L6G, 35L6GT
35S	35S/51S, 51S, 35/51, 35, 51
35S/51S	35S, 51S, 35/51, 35, 51
35W4	35W4A
35W4A	
35Y4	
35Z3	
35Z4GT	

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 35Z5G-50A5 ●

<i>To Replace</i>	<i>Use</i>
35Z5G	35Z5GT, 35Z5GT/G
35Z5GT	35Z5G, 35Z5GT/G
35Z5GT/G	35Z5G, 35Z5GT
35Z6G	
36	36A, 64*, 64A*
36A	36, 64*, 64A*
36AM3	36AM3A, 36AM3B
36AM3A	36AM3, 36AM3B
36AM3B	
37	76, 56AS*, 67*, 67A*
38	
38A3	
39	39/44, 44
39/44	39, 44
40	
40A1	
40B2	
40FR5	
40Z5	40Z5/45Z5GT, 45Z5GT
40Z5/45Z5GT	40Z5, 45Z5GT
41	
42	
43	
44	39, 39/44
45	45A
45A	45
45A5	
45B5	
45Z3	
45Z5GT	40Z5, 40Z5/45Z5GT
46	
47	
48	
49	
50	
50A1	
50A5	

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
50AX6G	
50B5	
50BK5	
50BM8	
50C5	50C5A
50C5A	
50C6G	50C6GA
50C6GA	50C6G
50CA5	50EH5, 50EH5A
50CD6G	
50DC4	
50EH5	50CA5, 50EH5A
50EH5A	
50FA5	
50FE5	
50FK5	
50FY8	
50HC6	
50HK6	50HC6
50L6GT	
50X6	
50Y6G	50Y6GT, 50Y6GT/G
50Y6GT	50Y6G, 50Y6GT/G
50Y6GT/G	50Y6G, 50Y6GT
50Y7GT	50Z7G, 50Z7GT
50Z6G	50AX6G
50Z7G	50Z7GT, 50Y7GT
50Z7GT	50Z7G, 50Y7GT
51	51S, 35, 35/51, 35S/51S, 35S
51S	51, 35, 35/51, 35S/51S, 35S
52	
53	
55	55S
55N3	
55S	55
56	56S, 27, 27S
56AS	67, 67A, 37*, 76*

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING TUBES 56S-88 ●

<i>To Replace</i>	<i>Use</i>
56S	56, 27, 27S
57	57S
57AS	6C6*, 77*
57S	57
58	58S
58AS	6D6*, 78*
58S	58
59	
60E3	
60EH5	
60FX5	
64	64A, 36*, 36A*
64A	64, 36*, 36A*
65	65A
65A	65
67	56AS, 67A, 37*, 76*
67A	56AS, 67, 37*, 76*
68	68A
68A	68
70A7GT	
70L7GT	
75	75S
75S	75
76	37, 56AS*, 67*, 67A*
77	6C6, 57AS*
78	6D6, 58AS
79	
80	5X3, 13
81	16, 16B
82	82V, 88
82V	82, 88
83	5Z3
83V	
84/6Z4	6Z4
85	
85AS	
88	82, 82V

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
89	89Y
89Y	89
96	
117L7GT	117L7/M7GT, 117M7GT
117L7/M7GT	117L7GT, 117M7GT
117M7GT	117L7GT, 117L7/M7GT
117N7GT	117P7GT
117P7GT	117N7GT
117Z3	
117Z4GT	
117Z6G	117Z6GT, 117Z6GT/G
117Z6GT	117Z6G, 117Z6GT/G
117Z6GT/G	117Z6G, 117Z6GT
807	
950	
951	1B4P, 1B4T, 32
5642	
5879	
5881	6L6GC, 7581, 7581A
6080	6AS7G, 6AS7GA
6267	
6550	
6973	
7025	7025A, 12AX7, 12AX7A, 12DF7, 12DT7, 12AD7*, 12BZ7*, 12DM7*
7025A	7025, 12AX7, 12AX7A, 12DF7, 12DT7, 12AD7*, 12BZ7*, 12DM7*
7027	7027A
7027A	
7189	7189A
7189A	
7199	
7247	12DW7
7355	
7382	
7408	6V6, 6V6G, 6V6GT, 6V6GTA, 6V6GT/G
7500	

‡ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
7534	
7543	6AU6, 6AU6A
7581	7581A, 6L6GC
7581A	
7591	
7687	
7695	
7754	
7867	6EX6*
7868	
9001	
9002	
9003	
VR75	OA3
VR90	OB3
VR105	OC3
VR150	OD3
XXB	3C6
XXD	14AF7
XXFM	7X7
XXL	7A4
X155	6BC8, 6BQ7, 6BQ7A, 6BS8, 6BX8, 6BZ7, 6BZ8, 6BK7*, 6BK7A*, 6BK7B*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

## Section 2

### CROSS REFERENCE OF SUBMINIATURE TUBES

This section lists subminiature tubes and recommended substitutes. Tubes are listed in numerical-alphabetical order, with the substitutes shown in the right-hand column.

To use this section, locate the tube type to be replaced in the left-hand column. Then refer to the right-hand column for the substitute. The substitutes are only those tubes which have similar, or improved, characteristics and can be inserted directly into the socket. No rewiring or mechanical changes are needed, although the associated service controls may have to be readjusted. When no substitutes are shown, none are recommended.

Substitutes marked with an asterisk (\*) should be used only when the filament of the original tube is wired in a parallel circuit, or in a series circuit not requiring controlled warm-up time.

● SUBMINIATURE TUBES 1AC5-1T6 ●

<i>To Replace</i>	<i>Use</i>
1AC5	1V5
1AD4	
1AD5	1W5
1AE5	
1AG4	
1AG5	2E41, 2E42, CK551AXA, 1AJ5*, 1AK5*
1AH4	1AK4*
1AJ5	1AG5*, 1AK5*
1AK4	1AH4*
1AK5	1AG5*, 1AJ5*
1C8	1E8
1E8	1C8
1Q6	
1S6	1T6
1T6	1S6

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
1V5	1AC5
1V6	
1W5	1AD5
2B5	
2E31	2E32, CK553AXA
2E32	2E31, CK553AXA
2E35	2E36, CK502AX
2E36	2E35, CK502AX
2E41	1AG5, 2E42
2E42	1AG5, 2E41
2G21	2G22
2G22	2G21
6AD4	
6AK4	
6AZ5	
6BA5	
6BF7	6BF7A, 6BG7, 6021
6BF7A	6BF7, 6BG7, 6021
6BG7	6BF7, 6BF7A, 6021
6W2	
6X2	6W2*
CK501AX	
CK502AX	2E35, 2E36
CK503AX	CK518AX, 5854
CK505AX	
CK506AX	
CK507AX	
CK509AX	CK515BX
CK510AX	
CK511X	
CK512AX	CK574AX, 6281
CK515BX	CK509AX
CK516AX	
CK518AX	CK503AX
CK520AX	

<i>To Replace</i>	<i>Use</i>
CK521AX	
CK522AX	CK528AX, 6088
CK523AX	
CK524AX	
CK525AX	
CK526AX	CK537AX
CK527AX	
CK528AX	CK522AX, 6088
CK529AX	CK535AX
CK531DX	
CK532DX	
CK533AX	CK536AX
CK534AX	
CK535AX	CK529AX
CK536AX	CK533AX
CK537AX	CK526AX
CK538DX	
CK539DX	
CK541DX	
CK542DX	CK542DXS
CK542DXS	CK542DX
CK543DX	
CK544DX	
CK545DX	
CK546DX	6519
CK547DX	
CK548DX	6418
CK549DX	6419
CK551AXA	1AG5
CK553AXA	2E31, 2E32
CK556AX	5676, 6050
CK568AX	5677
CK569AX	5678
CK570AX	5697
CK571AX	5886

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• SUBMINIATURE TUBES CK573AX-5634 •

<i>To Replace</i>	<i>Use</i>
CK573AX	6029
CK574AX	CK512AX, 6281
CK605CX	CK623CX, 5702, 5702WA, 5702WB, 6148
CK606BX	5704, 5704WA
CK608CX	5703, 5703WA, 5703WB, 6149
CK619CX	5744, 5744WA, 5744WB, 6151
CK623CX	5702, 5702WA, 5702WB, 6148
CK628	6247
SD828A	5638
SD828E	5634
SD917A	5637
SN944	5633
SN947	5640
SN947C	5640
SN954	5641
SN957A	5645
SC968B	5987
SN986B	5916
SD989B	5903
CK1036	6436
CK1037	6437
CK1038	
CK1039	6438
CK1042	6659
CK1045	6542
CK1050A	7979
CK1053	
CK1061	
CK1089	
CK1362	
CK1363	
CK1614	
CK1625	
5633	5634
5634	5633

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
5635	
5636	5636A
5636A	
5637	5719
5638	SD828A
5639	5639A, 5639WA
5639A	5639WA
5639WA	
5640	5902
5641	5641A, SN954
5641A	
5643	
5644	5644A
5644A	
5645	SN957A
5646	
5647	5647A
5647A	
5672	
5676	CK556AX, 6050
5677	CK568AX
5678	CK569AX
5694	
5697	CK570AX
5702	5702WA, 5702WB, 6148, CK605CX, CK623CX, 6540
5702WA	5702WB, 6148, 6540
5702WB	6148
5703	5703WA, 5703WB, 6149, CK608CX
5703WA	5703WB
5703WB	
5704	5704WA
5704WA	
5718	5718A, 5897
5718A	5897

<i>To Replace</i>	<i>Use</i>
5719	5719A, 5898, 5637
5719A	5898, 5637
5744	5744WA, 5744WB, 6151, CK619CX
5744WA	5744WB, 6151, CK619CX
5744WB	6151, CK619CX
5783	5783WA, 5783WB
5783WA	5783WB
5783WB	
5784	5784WA, 5784WB, 6150
578WA	5784WB
5784WB	
5785	
5787	5787WA, 5787WB
5787WA	5787WB
5787WB	
5797	
5798	
5829	5829WA
5829WA	
5840	5840A, 5901, 6205
5840A	5901, 6205
5851	6397
5854	CK503AX
5873	
5875	
5884	
5885	
5886	CK571AX
5889	
5896	5896A, 6052
5896A	6052
5897	5718, 5718A
5898	
5899	5899A, 5900, 6206, 6206A
5899A	6206, 6206A

<i>To Replace</i>	<i>Use</i>
5900	5899, 5899A, 6206
5901	
5902	5902A, 5902WA, 5640
5902A	5902WA
5902WA	
5903	6053, SD989B
5904	6055
5905	
5906	
5907	6056
5908	
5916	SN986B
5967	
5968	
5969	
5970	
5971	
5972	
5975	6152*
5987	SC968B
5995	
6021	6021A, 6021WA, 6BF7, 6BG7
6021A	6021WA
6021WA	
6029	CK573AX
6049	
6050	5676, CK556AX
6051	
6052	
6053	
6056	5907
6088	CK522AX, CK528AX
6092	
6110	
6111	6111A, 6111WA

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• SUBMINIATURE TUBES 6111A-6612 •

<i>To Replace</i>	<i>Use</i>
6111A	6111WA
6111WA	
6112	6112A, 6112WA
6112A	6112WA
6112WA	
6147	
6148	5702WA, 5702WB
6149	5703WA, 5703WB
6150	5784WA, 5784WB
6151	5744WA, 5744WB
6152	5975*
6205	
6206	6206A
6206A	
6213	
6222	
6245	
6247	6247WA, CK628
6247WA	
6281	CK574AX
6286	
6397	
6418	CK548DX
6419	CK549DX
6436	CK1036
6437	CK1037
6438	CK1039
6519	CK546DX
6526	
6533	6533WA
6533WA	
6540	
6542	CK1045
6611	
6612	

<i>To Replace</i>	<i>Use</i>
6659	CK1042
6690	
6788	
6814	
6832	
6872	
6943	
6944	
6945	
6946	
6947	
6948	
7099	
7246	
7323	
7327	
7401	
7759	
7760	
7761	
7762	
7887	
7888	
7889	
7962	
7963	
7979	

• SUBMINIATURE TUBES 6659-7979 •

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

### Section 3

## INDUSTRIAL SUBSTITUTES FOR RECEIVING TUBES

In this section are those American receiving tubes that can be replaced by industrial types. The receiving tubes are listed in the left-hand column and their industrial substitutes in the right-hand column. Each tube listed has one or more substitutes. If a tube type does not appear in the listing, an industrial substitute is not recommended.

This substitution list should be used in one direction only—that is, an industrial type to replace a standard type. If the equipment is already designed for an industrial tube, a standard receiving tube will not usually work as efficiently or as long as the original.

Substitutes marked with an asterisk (\*) should be used only when the filament of the original tube is wired in a parallel circuit, or in a series circuit not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
OA2	OA2WA, 6073, 6626
OA4G	1267
OB2	OB2WA, 6074, 6627
OC3	OC3W
OD3	OD3W
OZ4A	1003
1F4	2101
1R4	1294
1R5	1R5WA
1T4	1T4WA
1U4	1U4WA, 5910
1U5	1U5WA
2A3	2A3W, 5930
2A6	1659
2X2	879

<i>To Replace</i>	<i>Use</i>
3B7	1291
3D6	1299
3V4	3V4WA
5R4GY	5R4WGA, 5R4WGB, 5R4WGY
5U4G	5U4WG, 5U4WGB, 5931
5Y3GT	5Y3WGT, 5Y3WGTA, 5Y3WGTB, 6087, 6106
5Z3	1275
5Z4	6087
6AB4	6664
6AB7	1853
6AC7	6AC7W, 6AC7WA, 6AC7Y, 1852, 6134
6AG5	6AG5WA, 6186*
6AG7	6AG7Y
6AH6	6AH6WA, 6485
6AK5	6AK5W, 6AK5WA, 6AK5WB, 1220, 5654, 5591*, 6096, 6968
6AL5	6AL5W, 5726, 6058, 6097, 6663, 7631
6AM5	6516
6AM6	6064, 7498
6AN5	6AN5WA
6AQ5	6AQ5W, 6005, 6095, 6669
6AR6	6AR6WA, 6098, 6384
6AS6	6AS6W, 5725, 6187*
6AS7G	6AS7GYB, 6080WA, 6080WB, 6520
6AT6	6066
6AU6	6AU6WA, 6AU6WB, 6136
6AV6	6066
6BA6	6BA6W, 6BA6WA, 5749, 6660, 7496
6BE6	6BE6W, 5750, 7502*
6BH6	6265*, 6661
6BJ6	6662, 7694
6BL8	7643*
6BQ5	7320
6BR7	6059
6BW6	6061
6C4	6C4W, 6C4WA, 6100, 6135*

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

● RECEIVING-INDUSTRIAL 6C6-7AB7 ●

<i>To Replace</i>	<i>Use</i>
6C6	1221, 1223, 7700
6CB6	6676, 7732
6CH6	6132, 7499
6CL6	2014, 6197, 6297, 6677
6CQ6	6065
6CW4	7895
6CY5	7717
6DB6	6954
6DJ8	6922*
6DS4	7895
6F6	1611, 1621
6H6	6H6WGT
6J4	6J4W, 6J4WA
6J5	6J5WGT
6J6	6J6W, 6J6WA, 5964, 6030, 6045*, 6099, 6101, 6927*
6J7	1223, 1620, 7000
6K7	5732
6L6	6L6WA, 6L6WGA, 6L6WGB, 1622, 5932
6L7	1612, 1620
6Q7	6118
6SA7	6SA7WGT, 5961
6SC7	6SC7GTY, 1655
6SG7	6006
6SJ7	6SJ7WGT, 5693
6SK7	6SK7W, 6SK7WA, 6137
6SL7	6SL7GTY, 6SL7WGT, 5691*, 6113
6SN7GT	6SN7GTY, 6SN7WGT, 6SN7WGTA, 5692
6SQ7	6SQ7W
6SU7	6SU7WGT, 6188
6U8	1252, 6678, 7731
6V6	6V6GTY, 5871
6X4	6X4W, 6X4WA, 6063, 6202
6X5	6X5WGT, 5852*
6Y7G	1635
7AB7	1204



<i>To Replace</i>	<i>Use</i>
7AJ7	1273
7C4	1203, 1203A
7E5	1201
7F8	7F8W
7G7	1232
7G8	1206
7Y4	1274*
12A6	12A6GTY, 5659
12AT7	12AT7WA, 12AT7WB, 6060, 6201, 6671, 6679, 7492, 7728
12AU7	12AU7WA, 5814*, 5814A*, 5814WA*, 5963, 6067, 6189, 6680, 7316, 7489, 7730
12AX7	12AX7WA, 5721, 5751*, 5751WA*, 6057, 6681, 7494, 7729
12AY7	6072*
12BH7	6913
12BY7	7733
12C8	1664, 5660
12J5	12J5WGT
12L6GT	1632*
12L8GT	1644
12SC7	1634
12SK7	5661
12SL7GT	2C52*
14C7	1280
14GT8	7724
25B6G	5824
25L6GT	6046
25W6GT	6046
26Z5	26Z5W
25Z6	25Z6WGT
26E6G	26E6WG, 26E6WGB
26Z5	26Z5W
28D7	28D7W, 1238
807	807W, 5933, 5933WA

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

## Section 4

### FOREIGN SUBSTITUTES FOR AMERICAN TYPES

This section lists foreign substitutes for American receiving tubes. Refer to this section only after checking for an American substitute in Sections 1 and 3.

American tubes are shown in the left-hand column; foreign equivalents are in the right-hand column. Only those American types which can be replaced with foreign brands have been included. For a list of foreign types with American equivalents, refer to Section 5.

Substitutes marked with an asterisk (\*) should be used only when the filament of the original tube is wired in a parallel circuit, or in a series circuit not requiring controlled warm-up time. Those tubes marked with a section symbol (§) may not work in all circuits.

<i>To Replace</i>	<i>Use</i>
OA2	150C2, M8223, STV150/30
OA4G	PL1267, Z300T
OB2	108C1, M8224, STV108/30
OD3	150C3
1A3	1D13, DA90
1A7GT	DK32, X14
1AB6	1C3, 1H35, DK96, X25
1AC6	1C2, DK92, X18, X20
1AD4	DF62
1AH5	1FD1, DAF96, ZD25
1AJ4	1F1, DF96, W25
1AN5	DF97
1B3GT	DY30, U41
1C5GT	DL35, N14
1E3	DC80

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

**To Replace****Use**


---

1F5G	KL35*
1H5GT	DAC32, HD14
1L4	1F2, DF92
1M3	DM70, DM71, Y25
1N3	DM71, DM70, Y25
1N5GT	DF33, Z14
1Q5GT	DL36
1R5	1C1, DK91, X17
1S2	DY86
1S2A	DY87
1S5	1FD9, DAF91, ZD17
1T2	R16, U37
1T4	1F3, DF91, W17
1U4	DF904
1U5	DAF92
1V6	DCF60
1X2A	DY80, R19
2ER5	XC95
2J2	U26
3C4	1P1, DL96, N25
3D6	DL29
3EH7	XF183
3EJ7	XF184
3Q4	DL95, N18
3Q5GT	DL33, N15, N16
3S4	1P10, DL92, N17
3V4	1P11, DL94, N19
4BL8	XCF80
4BS8	4R-HH2
4CM4	PC86
4EH7	YF183
4EJ7	YF184
4ES8	XCC189
5AR4	GZ34, U77
5AZ4	GZ30

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
5J6	5M-HH3
5T4	U52
5U4G	U52
5V4G	53KU, 54KU, GZ32, GZ33, U77
5Y3GT	U50
5Z4G	52KU, GZ30, R52, U77
6A6	B63
6A8	PH4, X63
6AB4	EC92
6AB8	63TP, ECL80, LN152
6AC7	6F10, OSW2190, OSW2600
6AD8	EBF81
6AF4	EC94
6AF7G	64ME*, EM34*
6AG5	EF96
6AG7	6L10, OSW2192, OSW2601
6AH6	6F36
6AJ4	EC84
6AJ8	6C12, 20D4, ECH81, X719
6AK5	DP61, EF95§, PM05§, M8100§
6AK8	6LD12, DH719, EABC80
6AL3	EY88
6AL5	6B32, 6D2, D2M9, D77, D152, D717, DD6, EAA91, EB91, EAA901, EAA901S, M8079, M8212, QA2404
6AM5	6P17, 7D9, DD7, DDR7, EL91, M8082*, N77, N144, QA2402, QN77*
6AM6	6F12, 8D3, EF91, HP6, M8083, PM07, QA2403, QZ77, SP6, Z77
6AN7	ECH80
6AQ4	6L34, EC91, M8099
6AQ5	6L31, BPM04, EL90, M8245, N727*
6AQ8	6L12, B719*, ECC85
6AS6	6F33, M8196
6AS7G	A1834, ECC230

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6AT6	DH77, EBC90
6AU4GT	6G-K17
6AU6	EF94
6AV4	6FX4*, EZ91
6AV6	6BC32, EBC91
6B8	EBF32*
6BA6	6F31, EF93, M8101, PM04, W727
6BD7	6LD13, EBC81
6BE6	6H31, EK90, HM04, X77, X727
6BE7	EQ80
6BH5	EF81
6BH6	E90F
6BJ5	N78
6BJ6	E99F
6BL8	ECF80
6BM5	6P9
6BM8	ECL82
6BN5	EL85
6BQ5	EL84, N709
6BQ6GT	6G-B6
6BQ7A	ECC180
6BR5	65ME, EM80
6BR7	8D5
6BS7	8D7
6BS8	6R-HH2
6BT4	66KU, EZ40, U150, U718*, UU9*, V61
6BW7	8D6
6BX4	6Z4
6BX6	64SPT, EF80, Z152, Z719
6BY7	6F19, 6F26, EF85, W719
6C4	EC90, L77, M8080, QA2401, QL77
6CA4	EZ81, U709*, UU12
6CA7	EL34, KT77
6CB6	EF190
6CD7	64ME, EM34
6CF6	EF190

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6CH6	7D10, EF82, EL821, EL822
6CJ5	6F16, 7F16, 62VP, EF41, HF61, W150§
6CJ6	EL81, EL820
6CK5	67PT, BF61, EL41, N150
6CK6	EL83, EL803§
6CL6	6L43
6CM4	EC86
6CM5	EL36
6CN6	5P29, EL38
6CQ6	6F21, 9D6, EF92, M8161, QA2400, QW77, V884, VP6, W77
6CS6	EH90
6CT7	EAF42, WD150
6CU7	6C9*, 6C10*, 62TH, ECH42, ECH43, X150*
6CV7	6LD3, 62DDT, DH150, DH718, EBC41
6CW5	EL86
6CW7	ECC84
6D8	X73*
6DA5	EM81
6DA6	EF89
6DC8	6FD12, EBF89
6DG7	EF89F
6DJ8	ECC88, E88CC*
6DL5	EL95
6DQ6A	6G-B9
6DR8	EBF83
6DS8	ECH83
6DT8	6AT7N
6DX8	ECL84
6DY5	EL82
6E5	6S5G, OSW3110
6E8G	ECH35*
6EC7	6F18, W739
6EH7	6F25, EF183
6EJ7	6F24, EF184

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6EL7	6F23
6ER5	EC95
6ES6	EF97
6ES8	ECC189
6ET6	EF98
6F5GT	H63
6F6G	KT63
6FC7	ECC89
6FG6	EM84, EM840
6FY5	EC97
6GB5	EL500
6GM8	ECC86
6GW8	ECL86
6H6	D63, EB34*, OSW3109
6HG8	ECF86
6HU8	ELL80
6J4	M8232, TM12
6J5	L63, OSW3112
6J6	6CC31, 6M-HH3, ECC91, M8081, T2M05
6J7	A863, EF37*, Z63
6K7	EF39*, OM6*, PF9, W61, W63
6L6	EL37
6L6GC	KT66
6L7	X64
6M5	EL80
6M6G	EL33*, KT61*, N147*
6N3	EY82
6N8	EBF80, WD709, ZD152
6Q7	DH63
6R3	63VP*, EY81
6S2	EY86
6S2A	EY87
6S7	KTW61, OF1
6SA7	6W-C5*, OSW3104
6SK7	OSW3111
6SL7	ECC35*

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6SN7GT	13D2, B65, ECC32*, QA2408, QB65
6SQ7	OSW3105
6T8	6LD12, DH719, EABC80
6U3	EY80
6U8	ECF82
6V4	EZ80§
6V6GT	OSW3106
6W7G	8D4*
6X4	6Z31, EZ90, QA2407*, U78*, U707, V2M70
6X5G	EZ35, U70, U147
7A7	EF22*, W143*, W148
7AN7	30L1, B319, PCC84
7B6	DH81
7B7	W149
7C6	DH149
7DJ8	PCC88
7ED7	30F5
7EK7	30L15
7FC7	PCC89
7HG8	PCF86
7S7	X81, X148
7Y4	U82*, U149
8B8	8R-HP1
8BQ5	XL84
9A8	8A8, 30C1, LZ319, LZ329, PCF80
9AK8	PABC80
9AQ8	PCC85
9BM5	9P9
9EN7	30C15
9GB8	30PL1
9U8	PCF82
12A8	OH4
12AC5	121VP, HF121, UF41, W142
12AD7	6L13*
12AH8	20D3

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.



<i>To Replace</i>	<i>Use</i>
12AJ7	HCH81
12AL5	HAA91, UAA91
12AT6	HBC90
12AT7	B152, B309, B739, ECC81, M8162, QA2406, QB309
12AU6	HF94
12AU7	B329, B749, ECC82, M8136
12AV6	12BC32, HBC91
12AX7	6L13, B339, B759, ECC83, M8137
12BA6	12F31, HF93
12BE6	12H31, HK90
12BQ6GT	12G-B6
12BY7	EL180
12C8	VP12D
12DF7	ECC83
12DT7	ECC83
12FB5	30P12
12HU8	PLL80
12K7	W76
12Q7GT	DH74, DH76
12S7	UAF42, WD142
12SN7GT	B36
12SQ7	OBC3
12SX7GT	B36
13CM5	XL36
13EC7	10F18, W119
13GC8	30PL1
14G6	UBC81
14K7	141TH, UCH42, UCH43, X142
14L7	10LD3, 141DDT, DH118, DH142, UBC41
15A6	N153, N309, PL83
15CW5	30P18, PL84
15DQ8	PCL84
16A5	30P16, 163PEN, N154, N329, PL82, PL87
16A8	PCL82

● AMERICAN-FOREIGN 12AJ7-16A8 ●

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
16AQ3	XY88
16GK8	30PL13, 30PL14
17C8	17N8, 171DDP, UBF80
17EW8	HCC85
17Z3	PY81, PY83, U153
18GD6	19M-R9
19AQ5	HL90
19CS4	U191
19D8	10C14, UCH81, X119
19T8	HABC80
19X3	19BD, 19U3, PY80, U152, U309
19Y3	19SU, PY82, U154, U192, U319
21A6	213PEN, N152, N359, PL81, PL820
25BQ6GT	25G-B6
25E5	N308, PL36
25GF6	30P4
25W6GT	KT32
27GB5	PL500
30A5	HL94
31A3	311SU, U142, UY41, UY42
35W4	HY90
35Z4GT	U76
38A3	U119, U381, UY85
45A5	451PT, BF451, N142, UL41
45B5	10P18, N119, UL84
50BM8	10PL12, UCL82
50C5	HL92
50L6GT	KT71
807	4Y25, 5S1, P17A, QE06/50, QV05-25
5642	DY70
5847	6R-R8C
6080	A1834, ECC230
6267	8D8, 6F22, EF86, M8195, Z729
6550	KT88
7025	B339, B759, ECC83, M8137
7543	EF94
7581	KT66

§ May not work in all circuits.

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

## Section 5

### AMERICAN SUBSTITUTES FOR FOREIGN TYPES

This section lists American substitutes for foreign receiving tubes. Foreign tubes are shown in the left-hand column; American equivalents are in the right-hand column. Only those foreign types which can be replaced with American brands have been listed. For a list of foreign equivalents for American types, refer to Section 4.

In most cases, there is only one American replacement shown as a direct equivalent to the foreign type. Other equivalents for the American replacement are listed in Sections 1 and 3. For example, the American replacement for the 6F10 is the 6AC7. If a 6AC7 is not available, Section 1 shows that a 6AJ7 can be used as a substitute. Therefore, the 6AJ7 can be used as a substitute for the 6F10.

Substitutes marked with an asterisk (\*) should be used only when the filament of the original tube is wired in a parallel circuit, or in a series circuit not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>	<i>To Replace</i>	<i>Use</i>
1C1	1R5	1P1	3C4
1C2	1AC6	1P10	3S4
1C3	1AB6	1P11	3V4
1D13	1A3	4R-HH2	4BS8
1F1	1AJ4	4Y25	807
1F2	1L4	5M-HH3	5J6
1F3	1T4	5P29	6CN6
1FD1	1AH5	5S1	807
1FD9	1S5	6AT7N	6DT8
1H35	1AB6	6B32	6AL5

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

<i>To Replace</i>	<i>Use</i>
6BC32	6AV6
6C9	6CU7*
6C10	6CU7*
6CC31	6J6
6D2	6AL5
6F10	6AC7
6F12	6AM6
6F16	6CJ5
6F18	6EC7
6F19	6BY7
6F21	6CQ6
6F22	6267
6F23	6EL7
6F24	6EJ7
6F25	6EH7
6F26	6BY7
6F31	6BA6
6F33	6AS6
6F36	6AH6
6FD12	6DC8
6G-B3A	6GW6
6G-B6	6BQ6GT
6G-B9	6DQ6A
6G-K17	6AU4GT
6H31	6BE6
6L10	6AG7
6L12	6AQ8
6L13	12AX7
6L31	6AQ5
6L34	6AQ4
6L43	6CL6
6LD3	6CV7
6LD12	6AK8
6LD13	6BD7
6M-HH3	6J6
6P9	6BM5
6P15	6BQ5

<i>To Replace</i>	<i>Use</i>
6P17	6AM5
6R-HH2	6BS8
6R-R8C	5847
6S5G	6E5
6V3P	6R3*
6W-C5	6SA7*
6Z4	6BX4
6Z31	6X4
7D9	6AM5
7D10	6CH6
7F16	6CJ5
8A8	9A8
8D3	6AM6
8D4	6W7G*
8D5	6BR7
8D6	6BW7
8D7	6BS7
8D8	6267
8R-HP1	8B8
9D6	6CQ6
9P9	9BM5
10C14	19D8
10F18	13EC7
10LD3	14L7
10P18	45B5
10PL12	50BM8
12BC32	12AV6
12F31	12BA6
12G-B3	12GW6
12G-B6	12BQ6GT
12G-K17	12D4A
12H31	12BE6
13D2	6SN7GT
17N8	17C8
18AK5	6028
19AJ8	19D8
19BD	19X3

To Replace	Use
19M-R9	18GD6
19SU	19Y3
19U3	19X3
20D3	12AH8
20D4	6AJ8
25G-B6	25BQ6GT
30C1	9A8
30F5	7ED7
30L1	7AN7
30L15	7EK7
30P4	25GF6
30P12	12FB5
30P16	16A5
30P18	15CW5
30P19	25GF6
30PL1	13GC8
30PL13	16GK8
52KU	5Z4G
62DDT	6CV7
62TH	6CU7
62VP	6CJ5
63TP	6AB8
64ME	6CD7
64SPT	6BX6
65ME	6BR5
66KU	6BT4
67PT	6CK5
108C1	OB2
121VP	12AC5
141DDT	14L7
141TH	14K7
150C2	OA2
150C3	OD3
163PEN	16A5
171DDP	17C8
213PEN	21A6
311SU	31A3

To Replace	Use
451PT	45A5
A863	6J7GT
A1834	6AS7G
AD	6Z3
B36	12SN7GT
B63	6A6
B152	12AT7
B309	12AT7
B319	7AN7
B329	12AU7
B339	12AX7
B719	6AQ8*
B739	12AT7
B749	12AU7
B759	12AX7
BF61	6CK5
BF451	45A5
BPM04	6AQ5
D2M9	6AL5
D63	6H6
D77	6AL5
D152	6AL5
D717	6AL5
DA90	1A3
DAC32	1H5GT
DAF91	1S5
DAF92	1U5
DAF96	1AH5
DC80	1E3
DCF60	1V6
DD6	6AL5
DD7	6AM5
DDR7	6AM5
DF33	1N5GT
DF62	1AD4
DF91	1T4
DF92	1L4

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• FOREIGN - AMERICAN DF96-ECH35 •

<i>To Replace</i>	<i>Use</i>
DF96	1AJ4
DF97	1AN5
DF904	1U4
DH63	6Q7
DH74	12Q7GT
DH76	12Q7GT
DH77	6AT6
DH81	7B6
DH118	14L7
DH142	14L7
DH149	7C6
DH150	6CV7
DH718	6CV7
DH719	6AK8
DK32	1A7GT
DK91	1R5
DK92	1AC6
DK96	1AB6
DL29	3D6
DL33	3Q5GT
DL35	1C5GT
DL36	1Q5GT
DL92	3S4
DL94	3V4
DL95	3Q4
DL96	3C4
DM70	1M3
DM71	1N3
DP61	6AK5
DY30	1B3GT
DY70	5642
DY80	1X2A
DY86	1S2
DY87	1S2A
EAA91	6AL5
EABC80	6AK8
EAF42	6CT7

<i>To Replace</i>	<i>Use</i>
EB34	6H6*
EB91	6AL5
EBC41	6CV7
EBC80	6BD7
EBC90	6AT6
EBC91	6AV6
EBF32	6B8*
EBF80	6N8
EBF81	6AD8
EBF83	6DR8
EBF89	6DC8
EC84	6AJ4
EC86	6CM4
EC90	6C4
EC91	6AQ4
EC92	6AB4
EC94	6AF4
EC95	6ER5
EC97	6FY5
ECC32	6SN7GT*
ECC35	6SL7*
ECC81	12AT7
ECC82	12AU7
ECC83	12AX7
ECC84	6CW7
ECC85	6AQ8
ECC86	6GM8
ECC88	6DJ8
ECC89	6FC7
ECC91	6J6
ECC180	6BQ7A
ECC189	6ES8
ECC230	6080
ECF80	6BL8
ECF82	6U8
ECF86	6HG8
ECH35	6E8G*

<i>To Replace</i>	<i>Use</i>
ECH42	6CU7
ECH80	6AN7
ECH81	6AJ8
ECH83	6DS8
ECL80	6AB8
ECL82	6BM8
ECL84	6DX8
ECL86	6GW8
EF22	7A7*
EF37	6J7GT*
EF39	6K7*
EF41	6CJ5
EF80	6BX6
EF81	6BH5
EF82	6CH6
EF85	6BY7
EF86	6267
EF89	6DA6
EF89F	6DG7
EF91	6AM6
EF92	6CQ6
EF93	6BA6
EF94	6AU6
EF95	6AK5
EF96	6AG5
EF97	6ES6
EF98	6ET6
EF183	6EH7
EF184	6EJ7
EF190	6CB6
EH90	6CS6
EK90	6BE6
EL33	6M6G*
EL34	6CA7
EL36	6CM5
EL37	6L6
EL38	6CN6

<i>To Replace</i>	<i>Use</i>
EL41	6CK5
EL80	6M5
EL81	6CJ6
EL82	6DY5
EL83	6CK6
EL84	6BQ5
EL85	6BN5
EL86	6CW5
EL90	6AQ5
EL91	6AM5
EL95	6DL5
EL180	12BY7
EL500	6GB5
EL821	6CH6
EL822	6CH6
ELL80	6HU8
EM34	6CD7
EM80	6BR5
EM81	6DA5
EM84	6FG6
EM840	6FG6
EQ80	6BE7
EY80	6U3
EY81	6R3
EY82	6N3
EY86	6S2
EY87	6S2A
EY88	6AL3
EZ35	6X5G
EZ40	6BT4
EZ81	6CA4
EZ90	6X4
EZ91	6AV4
GZ30	5AZ4
GZ34	5AR4
H63	6F5GT
HAA91	12AL5

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• FOREIGN - AMERICAN HABC80-PCC84 •

<i>To Replace</i>	<i>Use</i>
HABC80	19T8
HBC90	12AT6
HBC91	12AV6
HCC85	17EW8
HCH81	12AJ7
HD14	1H5GT
HF61	6CJ5
HF93	12BA6
HF94	12AU6
HF121	12AC5
HK90	12BE6
HL90	19AQ5
HL92	50C5
HL94	30A5
HM04	6BE6
HP6	6AM6
HY90	35W4
KL35	1F5G*
KT32	25W6GT
KT61	6M6G*
KT63	6F6G
KT66	6L6GC
KT71	50L6GT
KT77	6CA7
KT88	6550
KTW61	6S7
L63	6J5
L77	6C4
LN152	6AB8
LZ319	9A8
LZ329	9A8
N14	1C5GT
N15	3Q5GT
N16	3Q5GT
N17	3S4
N18	3Q4
N19	3V4

<i>To Replace</i>	<i>Use</i>
N25	3C4
N77	6AM5
N78	6BJ5
N119	45B5
N142	45A5
N144	6AM5
N147	6M6G*
N150	6CK5
N152	21A6
N153	15A6
N154	16A5
N308	25E5
N309	15A6
N329	16A5
N359	21A6
N709	6BQ5
N727	6AQ5*
OBC3	12SQ7
OF1	6S7
OH4	12A8
OM6	6K7*
OSW2190	6AC7
OSW2192	6AG7
OSW2600	6AC7
OSW2601	6AG7
OSW3104	6SA7
OSW3105	6SQ7
OSW3106	6V6GT
OSW3109	6H6
OSW3110	6E5
OSW3111	6SK7
OSW3112	6J5
P17A	807
PABC80	9AK8
PC86	4CM4
PC95	4GK5
PCC84	7AN7



<i>To Replace</i>	<i>Use</i>
PCC85	9AQ8
PCC88	7DJ8
PCC89	7FC7
PCF80	9A8
PCF82	9U8
PCF86	7HG8
PCL82	16A8
PCL84	15DQ8
PF9	6K7
PH4	6A8
PL36	25E5
PL81	21A6
PL82	16A5
PL83	15A6
PL84	15CW5
PL500	27GB5
PL820	21A6
PL1267	OA4G
PLL80	12HU8
PM04	6BA6
PM07	6AM6
PY80	19X3
PY81	17Z3
PY82	19Y3
PY83	17Z3
QB65	6SN7GT
QB309	12AT7
QE06/50	807
QL77	6C4
QN77	6AM5*
QV05-25	807
QW77	6CQ6
QZ77	6AM6
R16	1T2
R19	1X2A
R52	5Z4G
SP6	6AM6

<i>To Replace</i>	<i>Use</i>
STV108/30	OB2
STV150/30	OA2
T2M05	6J6
TM12	6J4
U26	2J2
U37	1T2
U41	1B3GT
U50	5Y3GT
U52	5U4G
U70	6X5G
U76	35Z4GT
U78	6X4*
U82	7Y4*
U119	38A3
U142	31A3
U147	6X5G
U149	7Y4
U150	6BT4
U152	19X3
U153	17Z3
U154	19Y3
U192	19Y3
U309	19X3
U319	19Y3
U381	38A3
U707	6X4
U709	6CA4*
U718	6BT4*
UAA91	12AL5
UAF42	12S7
UBC41	14L7
UBC81	14G6
UBF80	17C8
UCH42	14K7
UCH81	19D8
UCL82	50BM8
UF41	12AC5

\* Parallel-filament circuits, or series circuits not requiring controlled warm-up time.

• FOREIGN - AMERICAN UL41-ZD152 •

<i>To Replace</i>	<i>Use</i>
UL41	45A5
UL84	45B5
UU9	6BT4*
UU12	6CA4
UY41	31A3
UY42	31A3
UY85	38A3
V2M70	6X4
V61	6BT4
V884	6CQ6
VP6	6CQ6
VP12D	12C8
W17	1T4
W25	1AJ4
W61	6K7
W63	6K7
W76	12K7
W77	6CQ6
W119	13EC7
W142	12AC5
W143	7A7*
W148	7A7
W149	7B7
W719	6BY7
W727	6BA6
W739	6EC7
WD142	12S7
WD150	6CT7
WD709	6N8
X14	1A7GT
X17	1R5
X18	1AC6
X20	1AC6

<i>To Replace</i>	<i>Use</i>
X25	1AB6
X63	6A8
X64	6L7
X73	6D8*
X77	6BE6
X81	7S7
X119	19D8
X142	14K7
X148	7S7
X150	6CU7*
X719	6AJ8
X727	6BE6
XC95	2ER5
XCC189	4ES8
XCf80	4BL8
XF183	3EH7
XF184	3EJ7
XL36	13CM5
XL84	8BQ5
XY88	16AQ3
Y25	1M3
YF183	4EH7
YF184	4EJ7
Z14	1N5GT
Z63	6J7
Z77	6AM6
Z152	6BX6
Z300T	OA4G
Z719	6BX6
Z729	6267
ZD17	1S5
ZD25	1AH5
ZD152	6N8

## Section 6

### PICTURE-TUBE SUBSTITUTES

This section lists all picture tubes, from the 7- to the 30-inch sizes. This listing is numerical-alphabetical, with the substitutes shown in the right-hand column. Substitutes are not recommended for some types and, for this reason, are not shown in many instances. The listing of a certain tube type as a substitute for another one does not necessarily mean the reverse is true. Always refer to the left-hand column for the original type number. Then find the substitute in the right-hand column.

Minor changes may be necessary when a picture tube is substituted. These changes are indicated by various symbols following the type number. The key to these symbols is given below. *Be absolutely certain* to refer to this key.

At the end of this section is a listing of those tubes that require odd filament voltages (other than 6.3 volts), or low  $E_{g2}$  potentials. This is a handy reference when setting up your picture-tube testing and rejuvenating equipment.

#### Key to Footnotes:

\* Omit ion trap.

\*\* Add ion trap.

# Connect pin 6 to pin 2 or pin 10.

1 Parallel-filament circuits only.

2 Mechanical changes may be required.

3 A change of accelerator-grid voltage may be required.

4 A change of focusing voltage may be required.

5 A change of brightness-control voltage may be required.

6 Add high-voltage filter capacitor.

7 Ground the *Aquadag* coating.

8 Change the anode connector.

9 Change the ion trap.

<i>To Replace</i>	<i>Use</i>
7RP4	7RP4A
7RP4A	7RP4
8AP4	8AP4A
8AP4A	8AP4
9QP4	9QP4A
9QP4A	9QP4
10ABP4	10ABP4A, 10ABP4B, 10ABP4C, 10AEP4 <sup>1</sup>
10ABP4A	10ABP4, 10ABP4B, 10ABP4C, 10AEP4 <sup>1</sup>
10ABP4B	10ABP4, 10ABP4A, 10ABP4C, 10AEP4 <sup>1</sup>
10ABP4C	10ABP4, 10ABP4A, 10ABP4B, 10AEP4 <sup>1</sup>
10ADP4	
10AEP4	10ABP4 <sup>1</sup> , 10ABP4A <sup>1</sup> , 10ABP4B <sup>1</sup> , 10ABP4C <sup>1</sup>
10BP4	10BP4A, 10BP4C <sup>9</sup> , 10BP4D <sup>9</sup> , 10FP4*, A*
10BP4A	10BP4, 10BP4C <sup>9</sup> , 10BP4D <sup>9</sup> , 10FP4*, A*
10BP4C	10BP4 <sup>9</sup> , 10BP4A <sup>9</sup> , 10BP4D, 10FP4*, A*
10BP4D	10BP4 <sup>9</sup> , 10BP4A <sup>9</sup> , 10BP4C, 10FP4*, A*
10CP4	
10DP4	
10EP4	
10FP4	10FP4A, 10BP4**, 10BP4A**, 10BP4C**, 10BD4D**
10FP4A	10FP4, 10BP4**, 10BP4A**, 10BP4C**, 10BP4D**
10HP4	
10MP4	10MP4A
10MP4A	10MP4
10RP4	
12AP4	
12CP4	
12JP4	12RP4**, 12QP4**, 12QP4A**
12KP4	12KP4A, 12ZP4**, 12ZP4A**
12KP4A	12KP4, 12ZP4**, 12ZP4A**

<i>To Replace</i>	<i>Use</i>
12LP4	12LP4A, 12LP4C, 12TP4 <sup>6</sup> , 12KP4*, 12KP4A*, 12ZP4 <sup>9</sup> , 12ZP4A <sup>9</sup>
12LP4A	12LP4, 12LP4C, 12KP4*, 12KP4A*, 12TP4 <sup>6</sup> , 12ZP4 <sup>9</sup> , 12ZP4A <sup>9</sup>
12LP4C	12LP4, 12LP4A, 12KP4*, 12KP4A*, 12TP4 <sup>6</sup> , 12ZP4 <sup>9</sup> , 12ZP4A <sup>9</sup>
12QP4	12QP4A, 12ZP4 <sup>8</sup> , 12ZP4A <sup>8</sup> , 12KP4 <sup>7,8*</sup> , A <sup>7,8*</sup>
12QP4A	12QP4, 12ZP4 <sup>8</sup> , 12ZP4A <sup>8</sup> , 12KP4 <sup>7,8*</sup> , A <sup>7,8*</sup>
12RP4	12JP4*, 12QP4*, 12QP4A*
12TP4	12LP4 <sup>7</sup> , 12LP4A <sup>7</sup> , 12LP4C <sup>7</sup>
12UP4	12UP4A, 12UP4B <sup>9</sup>
12UP4A	12UP4, 12UP4B <sup>9</sup>
12UP4B	12UP4 <sup>9</sup> , 12UP4A <sup>9</sup>
12VP4	12VP4A
12VP4A	12VP4
12WP4	
12XP4	12ZP4, 12ZP4A
12YP4	
12ZP4	12ZP4A, 12KP4*, 12KP4A*
12ZP4A	12ZP4, 12KP4*, 12KP4A*
14ACP4	14AEP4*, 14ARP4*, 14AUP4 <sup>1*</sup> , 14AWP4 <sup>1*</sup>
14AEP4	14ACP4 <sup>**</sup> , 14ARP4 <sup>3,5</sup>
14AJP4	14ASP4, 14AVP4
14ARP4	14AEP4 <sup>3,5</sup> , 14AUP4 <sup>1</sup> , 14AWP4 <sup>1</sup>
14ASP4	14AVP4
14ATP4	
14AUP4	14AWP4, 14ARP4 <sup>1</sup>
14AVP4	14ASP4
14AWP4	14AUP4, 14ARP4 <sup>1</sup>
14AZP4	
14BAP4	
14BP4	14BP4A, 14CP4, 14CP4A, 14EP4, 14DP4 <sup>6,9</sup> , 14UP4 <sup>6</sup>

● PICTURE TUBES 14BP4A-14XP4A ●

<i>To Replace</i>	<i>Use</i>
14BP4A	14BP4, 14CP4, 14CP4A, 14EP4, 14DP4 <sup>6,9</sup> , 14UP4 <sup>6</sup>
14CP4	14CP4A, 14BP4, 14BP4A, 14EP4, 14DP4 <sup>6,9</sup> , 14UP4 <sup>6</sup>
14CP4A	14CP4, 14BP4, 14BP4A, 14EP4, 14DP4 <sup>6,9</sup> , 14UP4 <sup>6</sup>
14DP4	14UP4 <sup>9</sup> , 14BP4 <sup>7,9</sup> , 14BP4A <sup>7,9</sup> , 14CP4 <sup>7,9</sup> , 14CP4A <sup>7,9</sup> , 14EP4 <sup>7,9</sup> , 14FP4 <sup>9</sup> , 14KP4A <sup>7,8,9</sup> , 14AZP4*
14EP4	14BP4, 14BP4A, 14CP4, 14CP4A, 14DP4 <sup>6,9</sup> , 14UP4 <sup>6</sup>
14FP4	14UP4, 14BP4 <sup>7</sup> , A <sup>7</sup> , 14CP4 <sup>7</sup> , A <sup>7</sup> , 14DP4 <sup>9</sup> , 14EP4 <sup>7</sup> , 14KP4A <sup>7,8</sup>
14GP4	
14HP4	14BAP4
14KP4	14KP4A, 14BP4 <sup>8</sup> , A <sup>8</sup> , 14CP4 <sup>8</sup> , A <sup>8</sup> , 14DP4 <sup>6,8,9</sup> , 14EP4 <sup>8</sup> , 14FP4 <sup>6,8</sup> , 14UP4 <sup>6,8</sup>
14KP4A	14BP4 <sup>8</sup> , A <sup>8</sup> , 14CP4 <sup>8</sup> , A <sup>8</sup> , 14EP4 <sup>8</sup>
14NP4	14NP4A, 14RP4, 14RP4A, 14SP4, 14WP4*, 14ZP4*, 14XP4 <sup>1</sup> , A <sup>1</sup>
14NP4A	14NP4, 14RP4, 14RP4A, 14SP4, 14WP4*, 14ZP4*, 14XP4 <sup>1</sup> , A <sup>1</sup>
14QP4	14QP4A, 14HP4
14QP4A	14QP4, 14HP4
14RP4	14RP4A, 14NP4, 14NP4A, 14SP4, 14WP4*, 14ZP4*, 14XP4 <sup>1</sup> , A <sup>1</sup>
14RP4A	14RP4, 14NP4, 14NP4A, 14SP4, 14WP4*, 14ZP4*, 14XP4 <sup>1</sup> , A <sup>1</sup>
14SP4	14NP4, 14NP4A, 14RP4, A, 14WP4*, 14ZP4*, 14XP4 <sup>1</sup> , A <sup>1</sup>
14UP4	14FP4, 14BP4 <sup>7</sup> , 14BP4A <sup>7</sup> , 14CP4 <sup>7</sup> , 14CP4A <sup>7</sup> , 14DP4 <sup>9</sup> , 14EP4 <sup>7</sup> , 14KP4A <sup>7,8</sup>
14WP4	14ZP4
14XP4	14XP4A, 14NP4 <sup>1</sup> , A <sup>1</sup> , 14RP4 <sup>1</sup> , A <sup>1</sup> , 14SP4 <sup>1</sup> , 14WP4* <sup>1</sup> , 14ZP4* <sup>1</sup>
14XP4A	14XP4, 14NP4 <sup>1</sup> , A <sup>1</sup> , 14RP4 <sup>1</sup> , A <sup>1</sup> , 14SP4 <sup>1</sup> , 14WP4* <sup>1</sup> , 14ZP4* <sup>1</sup>

<i>To Replace</i>	<i>Use</i>
14ZP4	14WP4
15AP4	15DP4**, A**
15CP4	15AP4**, 15DP4°, A°
15DP4	15DP4A, 15AP4*
15DP4A	15DP4, 15AP4*
15EP4	
15GP22	
15HP22	
16ABP4	16AEP4#
16ACP4	
16AEP4	16ABP4
16AFP4	
16AP4	16AP4A, 16AP4B
16AP4A	16AP4, 16AP4B
16AP4B	16AP4, 16AP4A
16CP4	16ZP4, 16LP4 <sup>7</sup> , 16LP4A <sup>7</sup>
16DP4	16DP4A
16DP4A	16DP4
16EP4	16EP4A, 16EP4B
16EP4A	16EP4, 16EP4B
16EP4B	16EP4, 16EP4A
16FP4	16DP4°, 16DP4A°
16GP4	16GP4A, 16GP4B, 16GP4C
16GP4A	16GP4, 16GP4B, 16GP4C
16GP4B	16GP4, 16GP4A, 16GP4C
16GP4C	16GP4, 16GP4A, 16GP4B
16HP4	16HP4A
16HP4A	16HP4
16JP4	16JP4A, 16HP4°, 16HP4A°
16JP4A	16JP4, 16HP4°, 16HP4A°
16KP4	16KP4A, 16RP4, 16RP4A
16KP4A	16KP4, 16RP4, 16RP4A
16LP4	16LP4A, 16ZP4, 16CP4 <sup>6</sup>
16LP4A	16LP4, 16ZP4, 16CP4 <sup>6</sup>
16MP4	16MP4A, 16JP4, A, 16HP4°, A°
16MP4A	16MP4, 16JP4, A, 16HP4°, A°

<i>To Replace</i>	<i>Use</i>
16QP4	16XP4, 16KP4 <sup>7,9</sup> , A <sup>7,9</sup> , 16RP4 <sup>7,9</sup> , A <sup>7,9</sup> , 16UP4 <sup>9</sup>
16RP4	16RP4A, 16KP4, 16KP4A
16RP4A	16RP4, 16KP4, 16KP4A
16SP4	16SP4A, 16VP4 <sup>6,9</sup> , 16WP4 <sup>6</sup> , A, B, 16YP4 <sup>7</sup>
16SP4A	16SP4, 16VP4 <sup>6,9</sup> , 16WP4 <sup>6</sup> , A, B, 16YP4 <sup>7</sup>
16TP4	16XP4 <sup>6,9</sup> , 16UP4 <sup>5,6</sup>
16UP4	16KP4 <sup>7</sup> , A <sup>7</sup> , 16RP4 <sup>7</sup> , A <sup>7</sup> , 16TP4 <sup>5,7</sup> , 16XP4 <sup>9</sup>
16VP4	16SP4 <sup>7,9</sup> , A <sup>7,9</sup> , 16WP4 <sup>9</sup> , A <sup>7,9</sup> , B <sup>7,9</sup> , 16YP4 <sup>7</sup>
16WP4	16WP4A <sup>7</sup> , B <sup>7</sup> , 16SP4, A, 16VP4 <sup>9</sup> , 16YP4 <sup>7,9</sup>
16WP4A	16WP4 <sup>6</sup> , B, 16SP4, A, 16VP4 <sup>6,9</sup>
16WP4B	16WP4 <sup>6</sup> , A, 16SP4, A, 16VP4 <sup>6,9</sup>
16XP4	16QP4, 16KP4 <sup>7,9</sup> , A <sup>7,9</sup> , 16RP4 <sup>7,9</sup> , A <sup>7,9</sup> , 16TP4 <sup>7,9</sup> , 16UP4 <sup>9</sup>
16YP4	16WP4 <sup>6</sup> , A, B, 16SP4 <sup>9</sup> , A <sup>9</sup> , 16VP4 <sup>6</sup>
16ZP4	16LP4, 16LP4A, 16CP4 <sup>6</sup>
17AP4	17BP4 <sup>6</sup> , 17BP4A, 17BP4B, 17BP4C, 17JP4
17ASP4	17BP4 <sup>6,8</sup> , 17BP4A <sup>8</sup> , 17BP4B <sup>8</sup> , 17BP4C <sup>8</sup>
17ATP4	17ATP4A, 17AVP4, A, 17BKP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4 <sup>*</sup> , 17BUP4, 17CBP4, 17CLP4
17ATP4A	17ATP4, 17AVP4, A, 17BKP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4 <sup>*</sup> , 17BUP4, 17CBP4, 17CLP4
17AVP4	17AVP4A, 17ATP4, A, 17BKP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4 <sup>*</sup> , 17BUP4, 17CBP4, 17CLP4
17AVP4A	17AVP4, 17ATP4, A, 17BKP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4 <sup>*</sup> , 17BUP4, 17CBP4, 17CLP4
17BJP4	17BNP4 <sup>3</sup> , 17BSP4 <sup>1</sup> , 17DCP4 <sup>1</sup>
17BKP4	17BKP4A, 17ATP4 <sup>1</sup> , A <sup>1</sup> , 17AVP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4 <sup>*1</sup> , 17BSP4 <sup>*</sup> , 17BUP4 <sup>1</sup> , 17CBP4 <sup>1</sup> , 17CLP4 <sup>1</sup> , 17DCP4 <sup>*1</sup> , 17DJP4 <sup>1</sup>
17BKP4A	17BKP4, 17ATP4 <sup>1</sup> , A <sup>1</sup> , 17AVP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4 <sup>*1</sup> , 17BSP4 <sup>*</sup> , 17BUP4 <sup>1</sup> , 17CBP4 <sup>1</sup> , 17CLP4 <sup>1</sup> , 17DCP4 <sup>*1</sup> , 17DJP4 <sup>1</sup>



<i>To Replace</i>	<i>Use</i>
17BMP4	17BUP4 <sup>3,5</sup> , 17CBP4 <sup>3,5</sup> , 17CLP4 <sup>3,5</sup> , 17BNP4*
17BNP4	17BJP4 <sup>3</sup> , 17BMP4**
17BP4	17BP4A <sup>7</sup> , 17BP4B <sup>7</sup> , 17BP4C <sup>7</sup> , 17JP4 <sup>7</sup> , 17AP4 <sup>7</sup>
17BP4A	17BP4 <sup>6</sup> , 17BP4B, 17BP4C, 17JP4, 17AP4
17BP4B	17BP4 <sup>6</sup> , 17BP4A, 17BP4C, 17JP4, 17AP4
17BP4C	17BP4 <sup>6</sup> , 17BP4A, 17BP4B, 17JP4, 17AP4 <sup>7</sup>
17BRP4	17BZP4* <sup>1</sup> , 17CAP4* <sup>1</sup> , 17CTP4* <sup>1</sup> , 17CVP4* <sup>1</sup> , 17CWP4* <sup>1</sup> , 17DHP4* <sup>1</sup> , 17DSP4*, 17EBP4* <sup>1</sup>
17BSP4	17CRP4 <sup>3</sup> , 17CXP4 <sup>3</sup>
17BTP4	
17BUP4	17CBP4, 17BMP4 <sup>3,5</sup> , 17BNP4 <sup>3</sup>
17BVP4	17BWP4* <sup>2</sup> , 17BYP4* <sup>1,2</sup> , 17CSP4* <sup>2</sup> , 17DQP4* <sup>1,2,3</sup>
17BWP4	17CSP4, 17BYP4 <sup>1</sup> , 17DQP4 <sup>1,3</sup>
17BYP4	17BWP4 <sup>1</sup> , 17CSP4 <sup>1</sup> , 17DQP4 <sup>3</sup>
17BZP4	17CAP4, 17CWP4, 17DSP4, 17BRP4**, 17CTP4 <sup>1</sup> , 17CVP4 <sup>1</sup> , 17EBP4 <sup>1</sup> , 17DHP4 <sup>1</sup>
17CAP4	17BZP4, 17CWP4, 17DSP4, 17BRP4**, 17CTP4 <sup>1</sup> , 17CVP4 <sup>1</sup> , 17EBP4 <sup>1</sup> , 17DHP4 <sup>1</sup>
17CBP4	17BUP4, 17BMP4 <sup>3</sup> , 17BNP4 <sup>3</sup>
17CDP4	
17CEP4	17CFP4 <sup>1</sup> , 17CNP4 <sup>1,3</sup> , 17CYP4 <sup>1</sup>
17CFP4	17CEP4 <sup>1</sup> , 17CNP4 <sup>3</sup> , 17CYP4
17CGP4	
17CKP4	17BRP4, 17BZP4* <sup>1</sup> , 17CAP4* <sup>1</sup> , 17CTP4 <sup>1</sup> , 17CVP4 <sup>1</sup>
17CLP4	17ATP4, A, 17AVP4, A, 17BUP4, 17CBP4, 17BMP4 <sup>3,5</sup> , 17BJP4*, 17DCP4* <sup>1</sup> , 17DJP4 <sup>1</sup>
17CMP4	17BNP4 <sup>1</sup> , 17CXP4 <sup>1</sup>
17CNP4	17CEP4 <sup>1,3</sup> , 17CFP4 <sup>1,3</sup> , 17CYP4 <sup>1,3</sup>

<i>To Replace</i>	<i>Use</i>
17CP4	17CP4A
17CP4A	17CP4
17CRP4	
17CSP4	17BWP4, 17BYP4 <sup>1</sup> , 17DQP4 <sup>1,3</sup>
17CTP4	17DHP4, 17EBP4, 17BRP4 <sup>1</sup> , 17BZP4 <sup>1</sup> , 17CAP4 <sup>1</sup> , 17CVP4 <sup>1</sup> , 17CWP4 <sup>1</sup> , 17DSP4 <sup>1</sup>
17CUP4	
17CVP4	17BRP4 <sup>1</sup> , 17BZP4 <sup>1</sup> , 17CAP4 <sup>1</sup> , 17CTP4 <sup>1</sup> , 17CWP4 <sup>1</sup> , 17DHP4 <sup>1</sup> , 17DSP4 <sup>1</sup> , 17EBP4
17CWP4	17DKP4, 17DLP4, 17DSP4, 17DTP4, 17DHP4 <sup>1</sup> , 17DXP4 <sup>1</sup> , 17DZP4 <sup>1</sup> , 17EBP4 <sup>1</sup>
17CXP4	17CRP4, 17BNP4 <sup>1</sup> , 17CMP4 <sup>1</sup>
17CYP4	17CFP4, 17CEP4 <sup>1</sup> , 17CNP4 <sup>3</sup>
17CZP4	
17DAP4	
17DBP4	17DWP4* <sup>1</sup> , 17HP4 <sup>1</sup> , A <sup>1</sup> , B <sup>1</sup> , 17KP4 <sup>1</sup> , A <sup>1</sup> , 17RP4 <sup>1</sup> , C <sup>1</sup>
17DCP4	
17DEP4	
17DHP4	17DXP4, 17EBP4, 17CWP4 <sup>1</sup> , 17DKP4 <sup>1</sup> , 17DLP4 <sup>1</sup> , 17DSP4 <sup>1</sup> , 17DTP4 <sup>1</sup> , 17DZP4 <sup>1</sup>
17DJP4	17ATP4 <sup>1</sup> , A <sup>1</sup> , 17AVP4 <sup>1</sup> , A <sup>1</sup> , 17BJP4* <sup>1</sup> , 17BKP4 <sup>1</sup> , A <sup>1</sup> , 17BSP4* <sup>1</sup> , 17BUP4 <sup>1</sup> , 17CBP4, 17CLP4 <sup>1</sup> , 17DCP4*
17DKP4	17DLP4, 17DXP4 <sup>1</sup> , 17DZP4 <sup>1</sup>
17DLP4	
17DQP4	17BWP4 <sup>1,3</sup> , 17BYP4 <sup>3</sup> , 17CSP4 <sup>1,3</sup>
17DRP4	
17DSP4	17DLP4, 17DTP4 <sup>1</sup> , 17DXP4 <sup>1</sup> , 17EBP4 <sup>1</sup>
17DTP4	17DLP4, 17DSP4, 17DXP4 <sup>1</sup> , 17DZP4 <sup>1</sup>
17DWP4	
17DXP4	17DKP4 <sup>1</sup> , 17DLP4 <sup>1</sup> , 17DZP4 <sup>1</sup>
17DZP4	17DXP4, 17DKP4 <sup>1</sup> , 17DLP4 <sup>1</sup> , 17DTP4 <sup>1</sup>
17EAP4	

<i>To Replace</i>	<i>Use</i>
17EBP4	17DSP4 <sup>1</sup>
17FP4	17FP4A
17FP4A	17FP4
17GP4	
17HP4	17HP4A, B, 17RP4, C, 17KP4, A, 17DBP4 <sup>1</sup> , 17DWP4*
17HP4A	17HP4, B, 17RP4, C, 17KP4, A, 17DBP4 <sup>1</sup> , 17DWP4*
17HP4B	17HP4, A, 17RP4, C, 17KP4, A, 17DBP4 <sup>1</sup> , 17DWP4*
17JP4	17BP4 <sup>6</sup> , 17BP4A, 17BP4B, 17BP4C, 17AP4
17KP4	17KP4A, 17HP4#, A#, B#, 17RP4#, C#, 17DBP4# <sup>1</sup> , 17DWP4#*
17KP4A	17KP4, 17HP4#, A#, B#, 17RP4#, C#, 17DBP4# <sup>1</sup> , 17DWP4#*
17LP4	17LP4A, 17VP4, 17VP4B, 17KP4, A
17LP4A	17LP4, 17VP4, 17VP4B, 17KP4, A
17QCP4	
17QP4	17QP4A, 17UP4, 17YP4
17QP4A	17QP4, 17UP4, 17YP4
17RP4	17RP4C, 17HP4, A, B, 17KP4, A, 17DBP4 <sup>1</sup> , 17DWP4*
17RP4C	17RP4, 17HP4, A, B, 17KP4, A, 17DBP4 <sup>1</sup> , 17DWP4*
17SP4	17LP4#, A#, 17VP4#, B#
17TP4	
17UP4	17QP4, 17QP4A, 17YP4
17VP4	17VP4B, 17LP4, 17LP4A
17VP4B	17VP4, 17LP4, 17LP4A
17YP4	17QP4, 17QP4A
19ABP4	
19ACP4	
19AEP4	
19AFP4	19AUP4, 19ATP4 <sup>1</sup> , 19BAP4 <sup>1</sup> , 19BCP4 <sup>1</sup> , 19CEP4 <sup>1</sup>

<i>To Replace</i>	<i>Use</i>
19AHP4	19ALP4 <sup>1</sup> , 19AQP4 <sup>1</sup> , 19AVP4 <sup>1</sup> , 19AXP4 <sup>1</sup> , 19AYP4 <sup>1</sup> , 19BLP4 <sup>1</sup> , 19XP4 <sup>1</sup>
19AJP4	
19ALP4	19AQP4 <sup>1</sup> , 19AVP4 <sup>1</sup> , 19AXP4 <sup>1</sup> , 19AYP4 <sup>1</sup> , 19BLP4 <sup>1</sup> , 19XP4 <sup>1</sup>
19ANP4	19BTP4 <sup>1</sup> , 19YP4 <sup>1</sup>
19AP4	19AP4A, 19AP4B, 19AP4C, 19AP4D
19AP4A	19AP4, 19AP4B, 19AP4C, 19AP4D
19AP4B	19AP4, 19AP4A, 19AP4C, 19AP4D
19AP4C	19AP4, 19AP4A, 19AP4B, 19AP4D
19AP4D	19AP4, 19AP4A, 19AP4B, 19AP4C
19AQP4	19ALP4, 19AVP4 <sup>1</sup> , 19AXP4 <sup>1</sup> , 19AYP4 <sup>1</sup> , 19BLP4 <sup>1</sup> , 19BMP4 <sup>1</sup> , 19XP4 <sup>1</sup>
19ARP4	19ASP4 <sup>1</sup>
19ASP4	19ARP4 <sup>1</sup>
19ATP4	19AFP4 <sup>1</sup> , 19AUP4 <sup>1</sup> , 19BAP4 <sup>1</sup> , 19BCP4 <sup>1</sup> , 19CEP4 <sup>1</sup>
19AUP4	19AFP4, 19ATP4, 19BAP4 <sup>1</sup> , 19BCP4 <sup>1</sup> , 19CEP4 <sup>1</sup>
19AVP4	19ALP4 <sup>1</sup> , 19AYP4 <sup>1</sup>
19AXP4	19AYP4, 19ALP4 <sup>1</sup> , 19AQP4 <sup>1</sup> , 19AVP4 <sup>1</sup> , 19BLP4 <sup>1</sup> , 19XP4 <sup>1</sup>
19AYP4	19AVP4 <sup>1</sup> , 19BHP4 <sup>1</sup>
19BAP4	19BCP4, 19CEP4, 19AFP4 <sup>1</sup> , 19ATP4 <sup>1</sup> , 19AUP4 <sup>1</sup>
19BCP4	19BAP4, 19CEP4, 19AFP4 <sup>1</sup> , 19ATP4 <sup>1</sup> , 19AUP4 <sup>1</sup>
19BDP4	
19BEP4	
19BFP4	
19BHP4	19AVP4, 19AYP4 <sup>1</sup>
19BLP4	19AVP4, 19BHP4, 19XP4, 19ALP4 <sup>1</sup> , 19AQP4 <sup>1</sup> , 19AXP4 <sup>1</sup> , 19AYP4 <sup>1</sup>
19BMP4	
19BRP4	
19BTP4	
19BVP4	

<i>To Replace</i>	<i>Use</i>
19BWP4	
19CAP4	
19CEP4	19AFP4 <sup>1</sup> , 19ATP4 <sup>1</sup> , 19AUP4 <sup>1</sup> , 19BAP4 <sup>1</sup> , 19BCP4 <sup>1</sup>
19CGP4	
19DP4	19DP4A, 19FP4 <sup>6,9</sup> , 19GP4 <sup>6</sup>
19DP4A	19DP4, 19FP4 <sup>6,9</sup> , 19GP4 <sup>6</sup>
19EP4	19JP4
19FP4	19GP4, 19DP4 <sup>7,9</sup> , A <sup>7,9</sup>
19GP4	19DP4 <sup>7</sup> , A <sup>7</sup> , 19FP4 <sup>9</sup>
19JP4	19EP4
19QP4	
19TP22	
19VP22	
19XP4	19AVP4, 19ALP4 <sup>1</sup> , 19AQP4 <sup>1</sup> , 19AXP4 <sup>1</sup> , 19AYP4 <sup>1</sup> , 19BHP4 <sup>1</sup> , 19BLP4 <sup>1</sup>
19YP4	19BTP4, 19ANP4 <sup>1</sup>
19ZP4	
20BP4	
20CP4	20CP4B, 20CP4C, 20DP4, 20DP4B, 20CP4A <sup>7</sup> , 20CP4D <sup>7</sup> , 20DP4A <sup>7</sup> , C <sup>7</sup>
20CP4A	20CP4D, 20DP4A, 20DP4C, 20CP4 <sup>6</sup> , 20CP4B <sup>6</sup> , 20CP4C <sup>6</sup> , 20DP4 <sup>6</sup> , 20DP4B <sup>6</sup>
20CP4B	20CP4, 20CP4C, 20DP4, 20DP4B, 20CP4A <sup>7</sup> , 20CP4D <sup>7</sup> , 20DP4A <sup>7</sup> , C <sup>7</sup>
20CP4C	20CP4, 20CP4B, 20DP4, 20DP4B, 20CP4A <sup>7</sup> , 20CP4D <sup>7</sup> , 20DP4A <sup>7</sup> , C <sup>7</sup>
20CP4D	20CP4A, 20DP4A, 20DP4C, 20CP4 <sup>6</sup> , 20CP4B <sup>6</sup> , 20CP4C <sup>6</sup> , 20DP4 <sup>6</sup> , 20DP4B <sup>6</sup>
20DP4	20DP4B, 20CP4, 20CP4B, 20CP4C, 20DP4A <sup>7</sup> , 20DP4C <sup>7</sup> , 20CP4A <sup>7</sup> , D <sup>7</sup>
20DP4A	20DP4C, 20CP4A, 20CP4D, 20DP4 <sup>6</sup> , 20DP4B <sup>6</sup> , 20CP4 <sup>6</sup> , 20CP4B <sup>6</sup> , 20CP4C <sup>6</sup>
20DP4B	20DP4, 20CP4, 20CP4B, 20CP4C, 20DP4A <sup>7</sup> , 20DP4C <sup>7</sup> , 20CP4A <sup>7</sup> , D <sup>7</sup>
20DP4C	20DP4A, 20CP4A, 20CP4D, 20DP4 <sup>6</sup> , 20DP4B <sup>6</sup> , 20CP4 <sup>6</sup> , 20CP4B <sup>6</sup> , 20CP4C <sup>6</sup>

● PICTURE TUBES 20FP4-21AMP4A ●

<i>To Replace</i>	<i>Use</i>
20FP4	20GP4 <sup>7</sup> , 20JP4 <sup>7</sup>
20GP4	20FP4 <sup>6</sup> , 20JP4
20HP4	20HP4B, 20HP4C, 20HP4A <sup>7</sup> , 20HP4D <sup>7</sup> , 20JP4 <sup>7</sup> , 20LP4 <sup>7</sup> , 20MP4 <sup>7</sup>
20HP4A	20HP4D, 20LP4, 20MP4, 20JP4, 20HP4 <sup>6</sup> , 20HP4B <sup>6</sup> , 20HP4C <sup>6</sup>
20HP4B	20HP4, 20HP4C, 20HP4A <sup>7</sup> , 20HP4D <sup>7</sup> , 20JP4 <sup>7</sup> , 20LP4 <sup>7</sup> , 20MP4 <sup>7</sup>
20HP4C	20HP4, 20HP4B, 20HP4A <sup>7</sup> , 20HP4D <sup>7</sup> , 20JP4 <sup>7</sup> , 20LP4 <sup>7</sup> , 20MP4 <sup>7</sup>
20HP4D	20HP4A, 20JP4, 20LP4, 20MP4, 20HP4 <sup>6</sup> , 20HP4B <sup>6</sup> , 20HP4C <sup>6</sup>
20JP4	20HP4 <sup>#7</sup> , A <sup>#</sup> , B <sup>#7</sup> , C <sup>#7</sup> , D <sup>#</sup> , 20LP4 <sup>#</sup> , 20MP4 <sup>#</sup>
20LP4	20HP4A, 20HP4D, 20JP4, 20MP4, 20HP4 <sup>6</sup> , 20HP4B <sup>6</sup> , 20HP4C <sup>6</sup>
20MP4	20HP4A, 20HP4D, 20JP4, 20LP4, 20HP4 <sup>6</sup> , 20HP4B <sup>6</sup> , 20HP4C <sup>6</sup>
21ACP4	21ACP4A, 21AMP4A, 21BSP4, 21CUP4
21ACP4A	21ACP4, 21AMP4A, 21BSP4, 21CUP4
21AFP4	21ASP4, 21KP4, A <sup>7</sup> , 21AYP4 <sup>7</sup> , 21BCP4 <sup>*7</sup> , 21XP4 <sup>7</sup> , A <sup>7</sup> , 21YP4 <sup>7</sup> , A <sup>7</sup>
21ALP4	21ALP4A, B, 21ATP4, A, B, 21BTP4, 21CWP4, 21ANP4 <sup>6</sup> , A <sup>6</sup> , 21BAP4 <sup>*</sup> , 21BNP4 <sup>*</sup> , 21CBP4 <sup>*2</sup> , 21CBP4A <sup>*2</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4 <sup>*</sup> , 21DVP4 <sup>1</sup>
21ALP4A	21ALP4, B, 21ATP4, A, B, 21BTP4, 21CWP4, 21ANP4 <sup>6</sup> , A <sup>6</sup> , 21BAP4 <sup>*</sup> , 21BNP4 <sup>*</sup> , 21CBP4 <sup>*2</sup> , 21CBP4A <sup>*2</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4 <sup>*</sup> , 21DVP4 <sup>1</sup>
21ALP4B	21ATP4A, B, 21BTP4, 21CWP4, 21BAP4 <sup>*</sup> , 21BNP4 <sup>*</sup> , 21CBP4A <sup>*2</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4 <sup>*</sup> , 21DVP4 <sup>1</sup>
21AMP4	21AMP4A, 21ACP4, 21ACP4A, 21BSP4, 21CUP4, 21AQP4 <sup>6</sup> , A <sup>6</sup>
21AMP4A	21AMP4, 21ACP4, 21ACP4A, 21BSP4, 21CUP4, 21AQP4 <sup>6</sup> , A <sup>6</sup>

<i>To Replace</i>	<i>Use</i>
21ANP4	21ANP4A, 21ALP4 <sup>7</sup> , A <sup>7</sup> , B <sup>7</sup> , 21ATP4 <sup>7</sup> , A <sup>7</sup> , B <sup>7</sup> , 21BAP4* <sup>7</sup> , 21BNP4* <sup>7</sup> , 21BTP4 <sup>7</sup> , 21CDP4 <sup>1,7</sup> , A <sup>1,7</sup> , 21CVP4* <sup>7</sup> , 21CWP4 <sup>7</sup> , 21DVP4 <sup>1,7</sup>
21ANP4A	21ANP4, 21ALP4 <sup>7</sup> , A <sup>7</sup> , B <sup>7</sup> , 21ATP4 <sup>7</sup> , A <sup>7</sup> , B <sup>7</sup> , 21BAP4* <sup>7</sup> , 21BNP4* <sup>7</sup> , 21BTP4 <sup>7</sup> , 21CDP4 <sup>1,7</sup> , A <sup>1,7</sup> , 21CVP4* <sup>7</sup> , 21CWP4 <sup>7</sup> , 21DVP4 <sup>1,7</sup>
21AP4	
21AQP4	21AQP4A, 21ACP4 <sup>7</sup> , A <sup>7</sup> , 21AMP4 <sup>7</sup> , A <sup>7</sup> , 21BSP4 <sup>7</sup> , 21CUP4 <sup>7</sup>
21AQP4A	21AQP4, 21ACP4 <sup>7</sup> , A <sup>7</sup> , 21AMP4 <sup>7</sup> , A <sup>7</sup> , 21BSP4 <sup>7</sup> , 21CUP4 <sup>7</sup>
21ARP4	21ARP4A
21ARP4A	21ARP4
21ASP4	21AFP4, 21AYP4 <sup>7</sup> , 21BCP4* <sup>7</sup> , 21KP4, A <sup>7</sup> , 21XP4 <sup>7</sup> , A <sup>7</sup> , 21YP4 <sup>7</sup> , A <sup>7</sup>
21ATP4	21ATP4A, B, 21ALP4, A, B, 21BTP4, 21CWP4, 21ANP4 <sup>6</sup> , A <sup>6</sup> , 21BAP4*, 21BNP4*, 21CBP4* <sup>2</sup> , 21CBP4A* <sup>2</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4*, 21DVP4 <sup>1</sup>
21ATP4A	21ATP4B, 21ALP4B, 21BTP4, 21CWP4, 21BAP4*, 21BNP4*, 21CBP4A* <sup>2</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4*, 21DVP4 <sup>1</sup>
21ATP4B	21ATP4A, 21ALP4B, 21BTP4, 21CWP4, 21BAP4*, 21BNP4*, 21CBP4A* <sup>2</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4*, 21DVP4 <sup>1</sup>
21AUP4	21AUP4A, 21AUP4B, 21AVP4, A, B, 21BDP4*
21AUP4A	21AUP4, 21AUP4B, 21AVP4, A, B, 21BDP4*
21AUP4B	21AUP4, 21AUP4A, 21AVP4, A, B, 21BDP4*
21AVP4	21AVP4A, 21AVP4B, 21AUP4, 21AUP4A, 21AUP4B, 21BDP4*
21AVP4A	21AVP4, 21AVP4B, 21AUP4, A, B, 21BDP4*

<i>To Replace</i>	<i>Use</i>
21AVP4B	21AVP4, A, 21AUP4, 21AUP4A, B, 21BDP4*
21AWP4	21WP4, A, 21ZP4 <sup>6</sup> , A, B
21AXP22	
21AXP22A	
21AYP4	21XP4, A, 21YP4, A, 21AFP4 <sup>6</sup> , 21ASP4 <sup>6</sup> , 21BCP4*, 21KP4 <sup>6</sup> , A
21BAP4	21BNP4, 21CVP4, 21ATP4A**, B**, 21BTP4**, 21CDP4** <sup>1</sup> , A** <sup>1</sup> , 21CWP4**, 21DVP4** <sup>1</sup>
21BCP4	
21BDP4	21AUP4A**, B**, 21AVP4A**, B**
21BNP4	21BAP4, 21CVP4, 21ATP4A**, B**, 21BTP4**, 21CDP4** <sup>1</sup> , A** <sup>1</sup> , 21CWP4**, 21DVP4** <sup>1</sup>
21BRP4	
21BSP4	21ACP4, 21ACP4A, 21AMP4A, 21CUP4
21BTP4	21ATP4A, B, 21CWP4, 21BAP4*, 21BNP4*, 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4*, 21DVP4 <sup>1</sup>
21CBP4	21CBP4A, B, 21DLP4, 21DQP4, 21DRP4, 21FLP4, 21CKP4 <sup>1</sup> , 21DJP4 <sup>1</sup> , 21ELP4 <sup>1</sup>
21CBP4A	21CBP4B, 21DLP4, 21DRP4, 21FLP4, 21CKP4 <sup>1</sup> , 21DJP4 <sup>1</sup> , 21ELP4 <sup>1</sup>
21CBP4B	21CBP4A, 21DLP4, 21DRP4, 21FLP4, 21CKP4 <sup>1</sup> , 21DJP4 <sup>1</sup> , 21ELP4 <sup>1</sup>
21CDP4	21CDP4A, 21ALP4B <sup>1</sup> , 21ATP4A <sup>1</sup> , B <sup>1</sup> , 21BAP4* <sup>1</sup> , 21BNP4* <sup>1</sup> , 21BTP4 <sup>1</sup> , 21CVP4* <sup>1</sup> , 21CWP4 <sup>1</sup> , 21DVP4 <sup>1</sup>
21CDP4A	21CDP4, 21ALP4B <sup>1</sup> , 21ATP4A <sup>1</sup> , B <sup>1</sup> , 21BAP4* <sup>1</sup> , 21BNP4* <sup>1</sup> , 21BTP4 <sup>1</sup> , 21CVP4* <sup>1</sup> , 21CWP4 <sup>1</sup> , 21DVP4 <sup>1</sup>
21CEP4	21CEP4A, 21DFP4 <sup>1</sup> , 21DWP4 <sup>1</sup>
21CEP4A	
21CGP4	
21CHP4	21CXP4 <sup>3</sup> , 21DJP4 <sup>1,3</sup> , 21DRP4 <sup>3</sup> , 21DSP4 <sup>3</sup> , 21ELP4 <sup>1,3</sup> , 21FLP4 <sup>3</sup>



<i>To Replace</i>	<i>Use</i>
21CKP4	21CBP4A, B, 21DJP4 <sup>1</sup> , 21DLP4 <sup>1</sup> , 21DRP4 <sup>1</sup> , 21ELP4 <sup>1</sup> , 21FLP4 <sup>1</sup>
21CLP4	
21CMP4	21DNP4, 21CBP4A*, B*, 21CKP4* <sup>1</sup> , 21DJP4* <sup>1</sup> , 21DRP4*, 21ELP4* <sup>1</sup> , 21ENP4 <sup>1</sup> , 21FLP4*
21CQP4	21CSP4 <sup>1</sup>
21CSP4	21CQP4 <sup>1</sup>
21CUP4	21ACP4, 21ACP4A, 21AMP4A, 21BSP4
21CVP4	21BAP4, 21BNP4, 21ATP4A**, B**, 21BTP4**, 21CDP4** <sup>1</sup> , A** <sup>1</sup> , 21CWP4**, 21DVP4** <sup>1</sup>
21CWP4	21ALP4B, 21ATP4A, B, 21BTP4, 21BAP4*, 21BNP4*, 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4*, 21DVP4 <sup>1</sup>
21CXP4	21DSP4, 21CHP4 <sup>3</sup> , 21CKP4 <sup>1,3</sup> , 21DJP4 <sup>1,3</sup> , 21DRP4 <sup>3</sup> , 21ELP4 <sup>1,3</sup> , 21FLP4 <sup>3</sup>
21CYP22	
21CYP22A	
21CZP4	21DAP4, 21DEP4, 21DEP4A, 21DHP4 <sup>1</sup> , 21DKP4 <sup>1</sup> , 21DKP4A <sup>1</sup>
21DAP4	21CZP4, 21DEP4, 21DEP4A, 21DHP4 <sup>1</sup> , 21DKP4 <sup>1</sup> , 21DKP4A <sup>1</sup>
21DEP4	21DEP4A, 21CZP4, 21DAP4, 21DHP4 <sup>1</sup> , 21DKP4 <sup>1</sup> , 21DKP4A <sup>1</sup>
21DEP4A	21DEP4, 21CZP4, 21DAP4, 21DHP4 <sup>1</sup> , 21DKP4 <sup>1</sup> , 21DKP4A <sup>1</sup>
21DFP4	21CEP4, A, 21DWP4
21DHP4	21CZP4 <sup>1</sup> , 21DAP4 <sup>1</sup> , 21DEP4 <sup>1</sup> , 21DEP4A <sup>1</sup> , 21DKP4 <sup>1</sup> , 21DKP4A <sup>1</sup>
21DJP4	21ELP4, 21CBP4A <sup>1</sup> , B <sup>1</sup> , 21CKP4 <sup>1</sup> , 21DLP4 <sup>1</sup> , 21DRP4 <sup>1</sup> , 21FLP4 <sup>1</sup>
21DKP4	21DKP4A <sup>1</sup> , 21CZP4 <sup>1</sup> , 21DAP4 <sup>1</sup> , 21DEP4 <sup>1</sup> , 21DEP4A <sup>1</sup> , 21DHP4 <sup>1</sup>
21DKP4A	21DKP4 <sup>1</sup> , 21CZP4 <sup>1</sup> , 21DAP4 <sup>1</sup> , 21DEP4 <sup>1</sup> , 21DEP4A <sup>1</sup> , 21DHP4 <sup>1</sup>
21DLP4	21DQP4

● PICTURE TUBES 21DMP4-21FDP4 ●

<i>To Replace</i>	<i>Use</i>
21DMP4	
21DNP4	21CBP4A* <sup>1</sup> , B* <sup>1</sup> , 21CKP4* <sup>1</sup> , 21CMP4 <sup>1</sup> , 21DJP4* <sup>1</sup> , 21DRP4* <sup>1</sup> , 21ELP4* <sup>1</sup> , 21ENP4 <sup>1</sup> , 21FLP4* <sup>1</sup>
21DP4	21MP4
21DQP4	21DLP4 <sup>1</sup>
21DRP4	21CBP4A, B, 21DLP4, 21CKP4 <sup>1</sup> , 21DJP4 <sup>1</sup> , 21ELP4 <sup>1</sup> , 21FLP4 <sup>1</sup>
21DSP4	21CXP4, 21CHP4 <sup>3</sup> , 21CKP4 <sup>1,3</sup> , 21DJP4 <sup>1,3</sup> , 21DRP4 <sup>3</sup> , 21ELP4 <sup>1,3</sup> , 21FLP4 <sup>3</sup>
21DVP4	21ALP4B <sup>1</sup> , 21ATP4A <sup>1</sup> , B <sup>1</sup> , 21BAP4* <sup>1</sup> , 21BNP4* <sup>1</sup> , 21BTP4 <sup>1</sup> , 21CDP4 <sup>1</sup> , A <sup>1</sup> , 21CVP4* <sup>1</sup> , 21CWP4 <sup>1</sup>
21DWP4	21CEP4, 21CEP4A, 21DFP4
21EAP4	
21ELP4	21DJP4, 21CBP4A <sup>1</sup> , B <sup>1</sup> , 21CKP4 <sup>1</sup> , 21DLP4 <sup>1</sup> , 21DRP4 <sup>1</sup> , 21FLP4 <sup>1</sup>
21EMP4	21EQP4, 21EXP4 <sup>1</sup>
21ENP4	21CBP4A* <sup>1</sup> , B* <sup>1</sup> , 21CKP4* <sup>1</sup> , 21CMP4 <sup>1</sup> , 21DJP4* <sup>1</sup> , 21DNP4 <sup>1</sup> , 21DRP4* <sup>1</sup> , 21ELP4* <sup>1</sup> , 21FLP4* <sup>1</sup>
21EP4	21EP4A <sup>7</sup> , 21EP4B <sup>7</sup>
21EP4A	21EP4 <sup>6</sup> , 21EP4B
21EP4B	21EP4 <sup>6</sup> , 21EP4A
21EQP4	21EXP4 <sup>1</sup>
21ERP4	
21ESP4	
21EVP4	
21EWP4	
21EXP4	21EQP4 <sup>1</sup>
21EYP4	
21EZP4	
21FAP4	
21FBP22	
21FCP4	
21FDP4	

<i>To Replace</i>	<i>Use</i>
21FJP22	21FKP22
21FKP22	21FJP22
21FLP4	21CBP4A, B, 21DLP4, 21DRP4, 21CKP4 <sup>1</sup> , 21DJP4 <sup>1</sup> , 21ELP4 <sup>1</sup>
21FP4	21FP4A <sup>7</sup> , 21FP4C <sup>7</sup> , 21KP4, A <sup>7</sup>
21FP4A	21FP4 <sup>6</sup> , 21FP4C, 21KP4 <sup>6</sup> , A
21FP4C	21FP4 <sup>6</sup> , 21FP4A, 21KP4 <sup>6</sup> , A
21JP4	21JP4A, 21FP4 <sup>***</sup> , A <sup>***</sup> , C <sup>***</sup> , 21KP4 <sup>6***</sup> , A <sup>**</sup>
21JP4A	21JP4, 21FP4 <sup>***</sup> , A <sup>***</sup> , C <sup>***</sup> , 21KP4 <sup>6***</sup> , A <sup>**</sup>
21KP4	21KP4A <sup>7</sup> , 21FP4 <sup>#</sup> , A <sup>#7</sup> , C <sup>#7</sup>
21KP4A	21KP4 <sup>6</sup> , 21FP4 <sup>#6</sup> , A <sup>#</sup> , C <sup>#</sup>
21MP4	21DP4
21WP4	21WP4A, 21AWP4, 21ZP4 <sup>6</sup> , A, B
21WP4A	21WP4, 21AWP4, 21ZP4 <sup>6</sup> , A, B
21XP4	21XP4A, 21AYP4, 21KP4A, 21YP4, A, 21AFP4 <sup>6</sup> , 21ASP4 <sup>6</sup> , 21BCP4 <sup>*</sup> , 21KP4 <sup>6</sup>
21XP4A	21XP4, 21AYP4, 21KP4A, 21YP4, A, 21AFP4 <sup>6</sup> , 21ASP4 <sup>6</sup> , 21BCP4 <sup>*</sup> , 21KP4 <sup>6</sup>
21YP4	21YP4A, 21AYP4, 21KP4A, 21XP4, A, 21AFP4 <sup>6</sup> , 21ASP4 <sup>6</sup> , 21KP4 <sup>6</sup>
21YP4A	21YP4, 21AYP4, 21KP4A, 21XP4, A, 21AFP4 <sup>6</sup> , 21ASP4 <sup>6</sup> , 21KP4 <sup>6</sup>
21ZP4	21ZP4A <sup>7</sup> , B <sup>7</sup> , 21AWP4 <sup>6</sup> , 21WP4 <sup>6</sup> , A <sup>6</sup>
21ZP4A	21ZP4B, 21AWP4, 21WP4, A, 21ZP4 <sup>6</sup>
21ZP4B	21ZP4A, 21AWP4, 21WP4, A, 21ZP4 <sup>6</sup>
22AP4	22AP4A
22AP4A	22AP4
23ACP4	23TP4
23AFP4	23BTP4
23AHP4	23ASP4 <sup>1</sup> , 23AWP4 <sup>1,3</sup> , 23AZP4 <sup>1</sup> , 23BJP4 <sup>1,3</sup>
23AKP4	23CVP4 <sup>1</sup>
23ALP4	23AMP4 <sup>1</sup> , 23MP4 <sup>1</sup> , A <sup>1</sup> , 23AQP4 <sup>1</sup>
23AMP4	23ALP4 <sup>1</sup> , 23MP4 <sup>1</sup> , A <sup>1</sup> , 23AQP4 <sup>1</sup>
23ANP4	23ATP4, 23BKP4, 23BLP4

● PICTURE TUBES 23AQP4-23BSP4 ●

<i>To Replace</i>	<i>Use</i>
23AQP4	23ALP4 <sup>1</sup> , 23AMP4 <sup>1</sup> , 23MP4 <sup>1</sup> , A <sup>1</sup>
23ARP4	23BCP4 <sup>1</sup> , 23CEP4 <sup>1</sup> , 23CMP4 <sup>1</sup>
23ASP4	
23ATP4	23ANP4, 23BKP4, 23BLP4
23AVP4	23CP4, 23CP4A, 23GP4, 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23SP4 <sup>1</sup> , 23UP4 <sup>1</sup>
23AWP4	23BJP4, 23AHP4 <sup>3</sup> , 23ASP4 <sup>3</sup> , 23AZP4 <sup>1,3</sup>
23AXP4	
23AYP4	23BEP4, 23BSP4, 23SP4, 23AVP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23GP4 <sup>1</sup> , 23UP4 <sup>1</sup>
23AZP4	23AHP4 <sup>1</sup> , 23ASP4 <sup>1</sup> , 23AWP4 <sup>1,3</sup> , 23BJP4 <sup>1,3</sup>
23BAP4	23BP4
23BCP4	23CMP4, 23ARP4 <sup>1</sup> , 23CEP4 <sup>1</sup>
23BDP4	23BMP4, 23BTP4, 23YP4, 23CDP4 <sup>1</sup> , 23CTP4 <sup>1</sup>
23BEP4	23BSP4, 23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23GP4 <sup>1</sup> , 23SP4 <sup>1</sup> , 23UP4 <sup>1</sup>
23BGP4	23BHP4
23BHP4	23BGP4
23BJP4	
23BKP4	23ANP4, 23ATP4, 23BLP4
23BLP4	23ANP4, 23ATP4, 23BKP4
23BMP4	23BDP4, 23BTP4, 23YP4, 23CDP4 <sup>1</sup> , 23CTP4 <sup>1</sup>
23BP4	23BAP4
23BQP4	23CBP4, 23UP4, 23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23GP4 <sup>1</sup> , 23SP4 <sup>1</sup>
23BRP4	23BYP4, 23CSP4, 23RP4, 23CUP4 <sup>1</sup> , 23DP4 <sup>1</sup>
23BSP4	23BEP4, 23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23GP4 <sup>1</sup> , 23SP4 <sup>1</sup> , 23UP4 <sup>1</sup>

<i>To Replace</i>	<i>Use</i>
23BTP4	
23BVP4	
23BYP4	23CSP4, 23BRP4 <sup>1</sup> , 23CUP4 <sup>1</sup> , 23DP4 <sup>1</sup> , 23RP4 <sup>1</sup>
23BZP4	
23CAP4	
23CBP4	23BQP4, 23UP4, 23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23GP4 <sup>1</sup> , 23SP4 <sup>1</sup>
23CDP4	23BDP4 <sup>1</sup> , 23BMP4 <sup>1</sup> , 23BTP4 <sup>1</sup> , 23CTP4 <sup>1</sup> , 23YP4 <sup>1</sup>
23CEP4	23ARP4 <sup>1</sup> , 23BCP4 <sup>1</sup> , 23CMP4 <sup>1</sup>
23CMP4	23ARP4 <sup>1</sup> , 23BCP4 <sup>1</sup> , 23CEP4 <sup>1</sup>
23CP4	23CP4A, 23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23GP4 <sup>1</sup> , 23UP4 <sup>1</sup>
23CP4A	23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23SP4 <sup>1</sup> , 23UP4 <sup>1</sup>
23CQP4	23FP4A <sup>1</sup>
23CSP4	23BYP4, 23BRP4 <sup>1</sup> , 23CUP4 <sup>1</sup> , 23DP4 <sup>1</sup> , 23RP4 <sup>1</sup>
23CTP4	23BDP4 <sup>1</sup> , 23BMP4 <sup>1</sup> , 23BTP4 <sup>1</sup> , 23CDP4 <sup>1</sup> , 23YP4 <sup>1</sup>
23CUP4	23DP4, 23BRP4 <sup>1</sup> , 23BYP4 <sup>1</sup> , 23CSP4 <sup>1</sup> , 23RP4 <sup>1</sup>
23CVP4	23AKP4 <sup>1</sup>
23CWP4	23CXP4 <sup>1</sup>
23CXP4	23CWP4 <sup>1</sup>
23DP4	23BRP4 <sup>1</sup> , 23BYP4 <sup>1</sup> , 23CSP4 <sup>1</sup> , 23CUP4 <sup>1</sup> , 23RP4 <sup>1</sup>
23EP4	
23FP4	23FP4A, 23CQP4 <sup>1</sup> , 23KP4A <sup>1</sup> , 23VP4 <sup>1</sup>
23FP4A	23CQP4 <sup>1</sup>

<i>To Replace</i>	<i>Use</i>
23GP4	23AVP4, 23CP4, A, 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23SP4 <sup>1</sup> , 23UP4 <sup>1</sup>
23HP4	23AVP4, 23CP4, A, 23GP4
23JP4	
23KP4	23KP4A, 23AKP4, 23CVP4 <sup>1</sup>
23KP4A	23AKP4, 23CVP4 <sup>1</sup>
23MP4	23MP4A, 23ALP4 <sup>1</sup> , 23AMP4 <sup>1</sup> , 23AQP4 <sup>1</sup>
23MP4A	
23NP4	23ALP4 <sup>1,3</sup> , 23AMP4 <sup>1,3</sup> , 23AQP4 <sup>1,3</sup> , 23MP4 <sup>3</sup> , A <sup>3</sup>
23RP4	23BRP4, 23BYP4, 23CSP4, 23CUP4 <sup>1</sup> , 23DP4 <sup>1</sup>
23SP4	23AYP4, 23BEP4, 23BSP4, 23AVP4 <sup>1</sup> , 23BQP4 <sup>1</sup> , 23CBP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23GP4 <sup>1</sup> , 23SP4 <sup>1</sup>
23TP4	
23UP4	23BQP4, 23CBP4, 23GP4, 23AVP4 <sup>1</sup> , 23AYP4 <sup>1</sup> , 23BEP4 <sup>1</sup> , 23BSP4 <sup>1</sup> , 23CP4 <sup>1</sup> , A <sup>1</sup> , 23SP4 <sup>1</sup>
23VP4	23CQP4 <sup>1</sup> , 23FP4A <sup>1</sup> , 23KP4A <sup>1</sup>
23WP4	23MP4, A, 23ALP4 <sup>1</sup> , 23AMP4 <sup>1</sup> , 23AQP4 <sup>1</sup>
23XP4	23BDP4, 23BMP4, 23BTP4, 23YP4, 23CDP4 <sup>1</sup> , 23CTP4 <sup>1</sup>
23YP4	23BDP4, 23BMP4, 23BTP4, 23CDP4 <sup>1</sup> , 23CTP4 <sup>1</sup>
23ZP4	
24ADP4	24VP4, A
24AEP4	24AUP4, 24ASP4 <sup>1</sup>
24AHP4	24ALP4, 24AQP4 <sup>1</sup> , 24AXP4 <sup>1</sup>
24AJP4	24ATP4
24ALP4	24AHP4, 24AQP4 <sup>1</sup> , 24AXP4 <sup>1</sup>
24AMP4	
24ANP4	24AEP4* <sup>1</sup> , 24ASP4* <sup>1</sup> , 24DP4 <sup>1</sup> , A <sup>1</sup> , 24YP4 <sup>1</sup> , 24ZP4* <sup>1</sup>

<i>To Replace</i>	<i>Use</i>
24AP4	24AP4A, 24AP4B
24AP4A	24AP4, 24AP4B
24AP4B	24AP4, 24AP4A
24AQP4	24AHP4 <sup>1</sup> , 24ALP4 <sup>1</sup> , 24AXP4 <sup>1</sup>
24ASP4	24AEP4 <sup>1</sup> , 24AUP4 <sup>1</sup>
24ATP4	24AJP4 <sup>1</sup>
24AUP4	
24AVP4	
24AWP4	
24AXP4	24AHP4 <sup>1</sup> , 24ALP4 <sup>1</sup> , 24AQP4 <sup>1</sup>
24BAP4	24AHP4 <sup>3</sup> , 24ALP4 <sup>3</sup>
24BP4	
24CP4	24CP4A, 24ADP4, 24TP4, 24VP4, 24VP4A, 24XP4 <sup>6</sup>
24CP4A	24CP4, 24ADP4, 24TP4, 24VP4, A, 24XP4 <sup>6</sup>
24DP4	24DP4A, 24ANP4, 24YP4, 24AEP4*, 24ASP4* <sup>1</sup> , 24ZP4*
24DP4A	24DP4, 24ANP4, 24YP4, 24AEP4*, 24ASP4* <sup>1</sup> , 24ZP4*
24QP4	24ADP4, 24CP4, A, 24TP4, 24VP4, A, 24XP4 <sup>6</sup>
24TP4	24ADP4, 24CP4, 24CP4A, 24VP4, 24VP4A, 24XP4 <sup>6</sup>
24VP4	24VP4A, 24ADP4
24VP4A	24VP4, 24ADP4
24XP4	24ADP4 <sup>7</sup> , 24CP4 <sup>7</sup> , 24CP4A <sup>7</sup> , 24TP4 <sup>7</sup> , 24VP4 <sup>7</sup> , 24VP4A <sup>7</sup>
24YP4	24ANP4, 24DP4, 24DP4A, 24AEP4*, 24ASP4* <sup>1</sup> , 24ZP4*
24ZP4	24AEP4, 24ANP4**, 24ASP4 <sup>1</sup> , 24DP4**, 24DP4A**, 24YP4**
27AP4	
27EP4	27GP4, 27RP4 <sup>7</sup>
27GP4	27EP4, 27RP4 <sup>7</sup>