



6AF6-G

ELECTRON-RAY TUBE

Twin Indicator Type

The 6AF6-G is a high-vacuum, heater-cathode type of tube designed to respond visually, by means of two shadows on a fluorescent target, to changes in the voltages applied to the control electrodes. It performs, therefore, as a voltage indicator and as such is particularly useful as a convenient and non-mechanical means to indicate accurate tuning of a receiver to the desired station.

Structurally, the 6AF6-G has a heater, a cathode, two ray-control electrodes, and a fluorescent target. Electrically, however, the 6AF6-G may be considered as two separate electron-ray tubes in one bulb, the cathode and target being common to both. Each control electrode can perform independently of the other to produce a separate shadow.

The control electrodes may be connected in parallel to give twin shadows or connected separately to give two independently controlled shadows. The voltage or voltages required for control are supplied to the 6AF6-G through one or more voltage amplifier tubes.

In addition to its two shadows, the 6AF6-G features small size which facilitates its use in compact receiver design.

TENTATIVE CHARACTERISTICS and RATINGS

|                               |                         |        |
|-------------------------------|-------------------------|--------|
| HEATER VOLTAGE (A.C. or D.C.) | 6.3                     | Volts  |
| HEATER CURRENT                | 0.15                    | Ampere |
| OVERALL LENGTH                | 2" to 2-5/16"           |        |
| MAXIMUM DIAMETER              | 1-3/16"                 |        |
| BULB                          | T-9                     |        |
| BASE                          | Small Shell Octal 7-Pin |        |

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

|                                                       |                                                 |     |              |
|-------------------------------------------------------|-------------------------------------------------|-----|--------------|
| TARGET VOLTAGE                                        | { 135 <i>max.</i> Volts<br>90 <i>min.</i> Volts |     |              |
| RAY-CONTROL-ELECTRODE SUPPLY VOLTAGE                  | 135 <i>max.</i> Volts                           |     |              |
| TYPICAL OPERATION:                                    |                                                 |     |              |
| Heater Voltage                                        | 6.3                                             | 6.3 | Volts        |
| Target Voltage                                        | 100                                             | 135 | Volts        |
| Target Current *                                      | 0.9                                             | 1.5 | Milliamperes |
| Ray-Control Electrode Voltage (Approx.) <sup>o</sup>  | 60                                              | 81  | Volts        |
| Ray-Control Electrode Voltage (Approx.) <sup>oo</sup> | 0                                               | 0   | Volts        |

For the control tube, a typical value of series-load resistor is  
\*, <sup>o</sup>, <sup>oo</sup>: See next page.

0.5 megohm, when the ray-control electrodes of the 6AF6-G are connected in parallel.

\* With 0 volts on ray-control electrodes. Subject to wide variation.

° For shadow angle of 0° produced by either ray-control electrode.

°° For shadow angle of 100° produced by either ray-control electrode.

## INSTALLATION

The *base* pins of the 6AF6-G fit the standard octal socket which may be installed to hold the tube in any position. For convenience, the tube is usually mounted horizontally so that the fluorescent target is readily visible when the receiver circuit is tuned.

The *heater* is designed to operate on either a.c. or d.c. For operation on a.c. with a transformer, the winding which supplies the heater circuit should operate the heater at its recommended value for full-load operating conditions at average line voltage. In a-c/d-c receivers, the heater can be operated in series with the heaters of other types having a 0.15-ampere rating. The current in the heater circuit should be adjusted to 0.15 ampere for the normal supply-line voltage.

The *cathode*, when the 6AF6-G is operated from a transformer, should preferably be connected directly to the heater circuit. In a-c circuits where the cathode is not connected directly to the heater, the potential difference between them should be kept as low as possible. When a series-heater arrangement is used, the cathode should be connected directly to the negative side of the d-c plate supply.

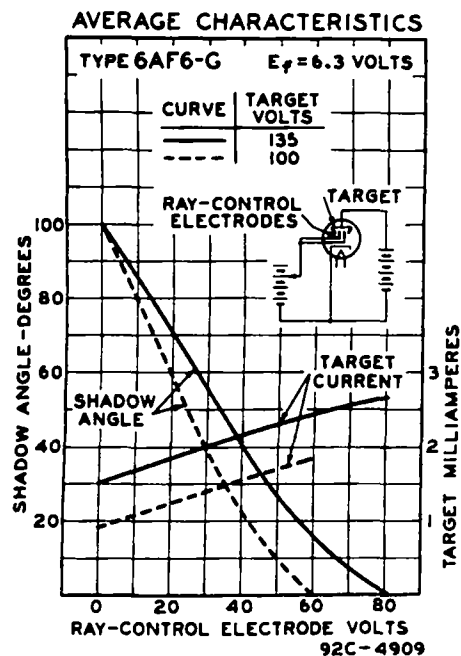
## APPLICATION

As a *visual indicator*, the 6AF6-G provides a convenient and non-mechanical means of tuning a receiver to the desired station.

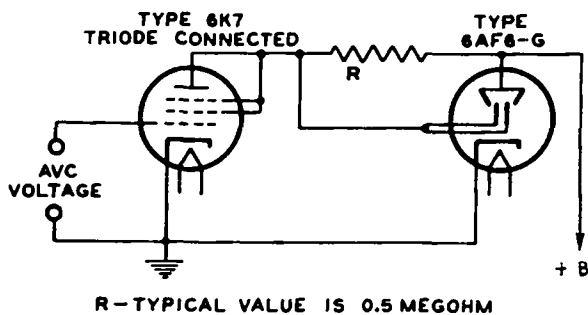
A typical circuit showing the use of the 6AF6-G with ray-control electrodes connected in parallel is shown on the next page. In this circuit, a triode-connected type 6K7 (or other triode-connected super-control amplifier tube with remote cut-off characteristic) is used to provide controlling voltage.

With this arrangement, the twin patterns vary from shaded angles of 100° with no controlling voltage (off tune) to shaded angles of approximately 0° at resonance with a strong carrier. Exact tuning is indicated by the narrowest shaded angles that can be obtained; the stronger the carrier, the narrower the angle.

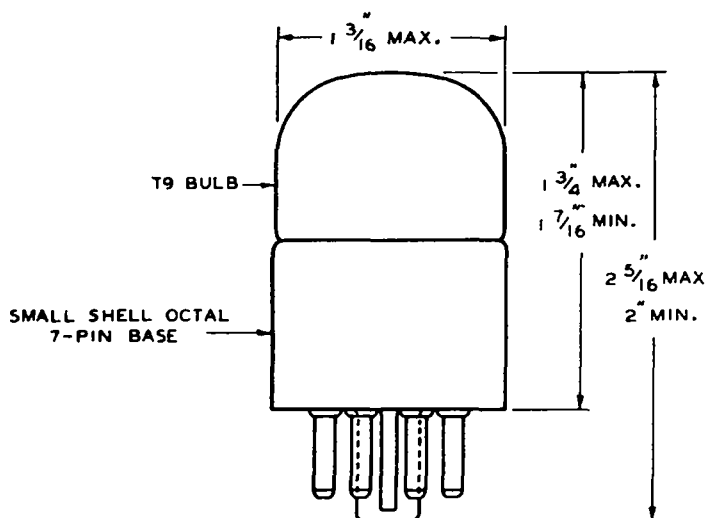
The 6AF6-G is also suitable for use in other applications. For example, it may be used in circuits where each control electrode is supplied with a separate controlling voltage.



**TYPICAL CIRCUIT USING TYPE 6AF6-G  
WITH RAY-CONTROL ELECTRODES IN PARALLEL**



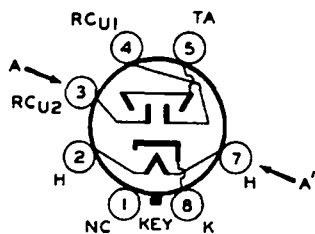
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92C-4902

**BOTTOM VIEW  
OF SOCKET CONNECTIONS**

AA' = PLANE OF RAY-CONTROL  
ELECTRODES



**7AG**

- H = HEATER
- K = CATHODE
- NC = NO CONNECTION
- RC<sub>U1</sub> = RAY-CONTROL ELECTRODE OF UNIT No.1
- RC<sub>U2</sub> = RAY-CONTROL ELECTRODE OF UNIT No.2
- TA = TARGET

**JETEC TYPE 6AF6G**

## DOUBLE INDICATOR

## MECHANICAL DATA

Outline drawing. . . . . 9-1 or 9-36      Bulb . . . . . T-9

Base . . . . . B6-81 or B7-7 intermediate shell octal  
or B6-84 or B7-59 short intermediate shell octal

Maximum diameter . . . . . 1-5/16"

Maximum overall length . . . . . 2-5/16"

|                                |         |
|--------------------------------|---------|
| Maximum seated height. . . . . | 1-3/4 " |
|--------------------------------|---------|

Pin connections. . . . . Basing 7AG

\*Pin 1 - No connection

**Pin 5 - Target**

Pin 2 - Heater

Pin 7 - Heater

Pin 3 - Ray-control electrode, unit #2

**Pin 8 - Cathode**

Pin 4 - Ray-control electrode, unit #1

\*Pin #1 omitted on Base Nos. B6-81 and B6-84

Mounting position . . . . . Any\*\*

**\*\*The plane of the ray-control electrodes passes through pins #3 and #7.**

## ELECTRICAL DATA

**Ratings:**

Heater voltage (ac or dc) . . . . . 6.3 volts

Heater current . . . . . 150 ma

|                                                        |           |
|--------------------------------------------------------|-----------|
| Maximum ray-control electrode supply voltage . . . . . | 250 volts |
|--------------------------------------------------------|-----------|

Maximum target voltage . . . . . 250 volts

Minimum target voltage . . . . . 125 volts

### Typical operating Conditions and Characteristics

Heater voltage\*\*\* . . . . . 6.3 6.3 volts

|                |     |     |       |
|----------------|-----|-----|-------|
| Target voltage | 135 | 250 | volts |
|----------------|-----|-----|-------|

|                 |     |         |
|-----------------|-----|---------|
| Target current# | 1.5 | 3.75 ma |
|-----------------|-----|---------|

|                                           |    |     |       |
|-------------------------------------------|----|-----|-------|
| Ray-control electrode voltage (approx.)## | 81 | 155 | volts |
|-------------------------------------------|----|-----|-------|

Ray-control electrode voltage### . . . . . 0 0 volts

\*\*\*In circuits where the cathode is not directly connected to the heater, the potential differences between heater and cathode should be kept as low as possible.

#With zero volts on rey-control electrodes. Subject to wide variation.

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##For shadow angle of 0° produced by either ray-control electrode.
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### For shadow angle of  $100^\circ$  produced by either ray-control electrode.

Refer to "Interpretation of Receiving Tube Ratings"