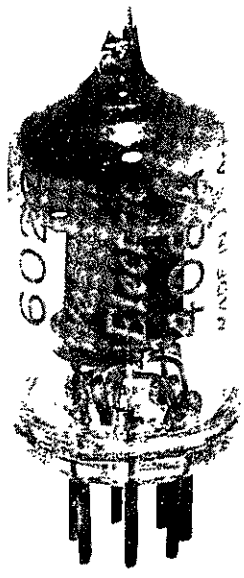
ELECTRON TUBE DATA SHEET

WESTERN ELECTRIC 408A* ELECTRON TUBE



DESCRIPTION

The 6028/408A* is a 7-pin miniature pentode having an indirectly heated cathode. It is designed for use in amplifier circuits at high and ultra high frequencies. It is also suitable for audio-frequency applications where exceptionally low microphonic noise is not a requirement.

CHARACTERISTICS

Heater Voltage		20 volts
Plate Current	$E_b = E_{c2}$ = 120 volts; Cathode-Bias Resistor = 200 ohms	7.5 milliamperes
Transconductance	$E_b = E_{c2}$ = 120 volts; Cathode-Bias Resistor = 200 ohms	5000 micromhos

GENERAL CHARACTERISTICS

ELECTRICAL DATA

Heater Voltage, A-C or D-C	20 volts
Heater Current	50 milliamperes

Direct Interelectrode Capacitances	without external shield	with external shield (RMA # 316)
Grid to Plate (maximum)	.019	*.010 uuf
Input	3.9	*4.0 uuf
Output	2.0	*2.9 uuf

MECHANICAL DATA

Cathode	Coated Unipotential
Bulb	T5 1/2
Base	Miniature Button 7-pin
Mounting Position	Any

Dimensions and pin connections shown in outline drawing on Page 5

MAXIMUM RATINGS, Design-Center Values

Plate Voltage	180 volts
Screen Grid Voltage	140 volts
Plate Dissipation	1.7 watts
Screen Grid Dissipation	0.5 watt
Cathode Current	18 milliamperes
Heater-Cathode Voltage[1]	120 volts
Bulb Temperature	120°centigrade

Maximum Grid Current Resistance for	
Fixed Bias	1.0 megohm
Cathode Bias	2.0 megohms

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS - CLASS A_1 AMPLIFIER

Plate Voltage	120	120 volts
Screen Grid Voltage	120	120 volts
Cathode-Bias Resistor	200	130 ohms
Peak A-F Grid Voltage	2.0	1.5 volts
Zero Signal Plate Current	7.5	9.4 milliamperes
Maximum Signal Plate Current	7.7	9.2 milliamperes
Zero Signal Screen Grid Current	2.5	3.2 milliamperes
Maximum Signal Screen Grid Current	3.3	3.9 milliamperes
Plate Resistance	0.30	0.25 megohm
Transconductance	5000	5600 micromhos
Load Resistance	15000	15000 ohms
Power Output	325	265 milliwatts
Total Harmonic Distortion	12	5.5 per cent
Grid Voltage, Approximate, for Plate Current of 10 Microamperes	-6.8	-6.8 volts

* External shield connected to cathode pins 2 and 7.

Note 1. For optimum tube life it is recommended that heater-cathode voltage should not exceed 90 volts.

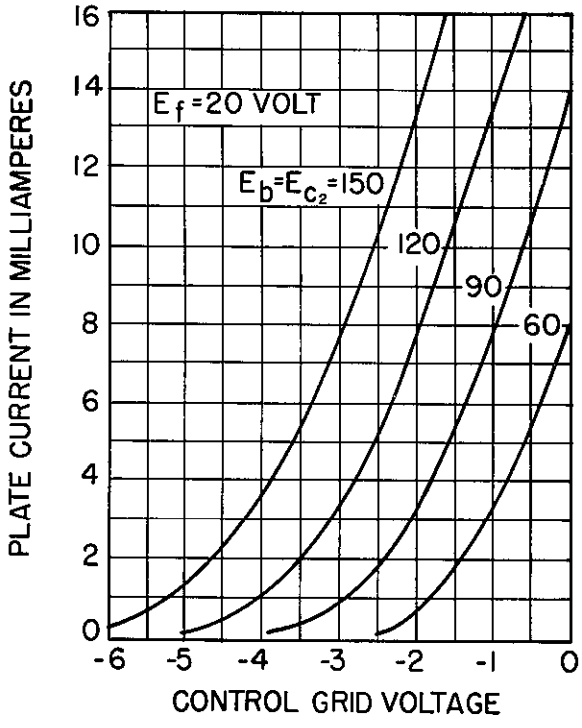
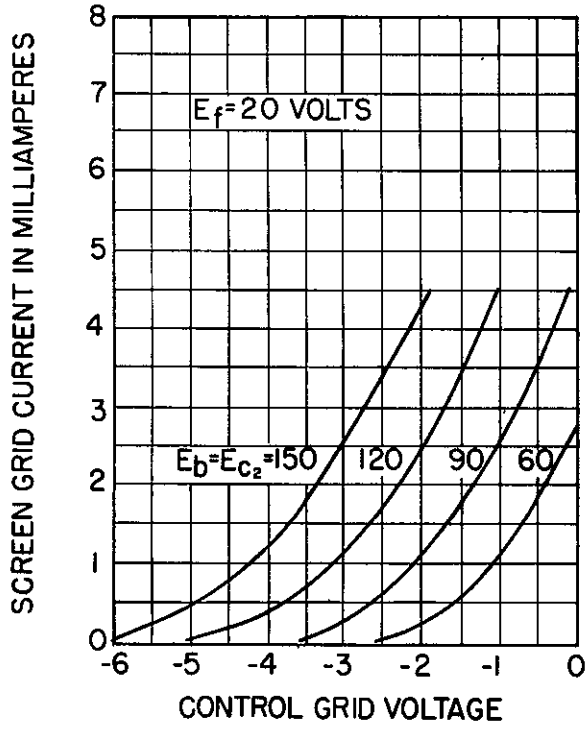


PLATE CURRENT IN MILLIAMPERES
16
14
12
10
8
6
4
2
0
E_f=20 VOLT
E_b=E_{c_2}=150
120
90
60
-6
-5
-4
-3
-2
-1
0
CONTROL GRID VOLTAGE


SCREEN GRID CURRENT IN MILLIAMPERES
8
7
6
5
4
3
2
1
0
E_f=20 VOLTS
E_b=E_{c_2}=150
120
90
60
-6
-5
-4
-3
-2
-1
0
CONTROL GRID VOLTAGE

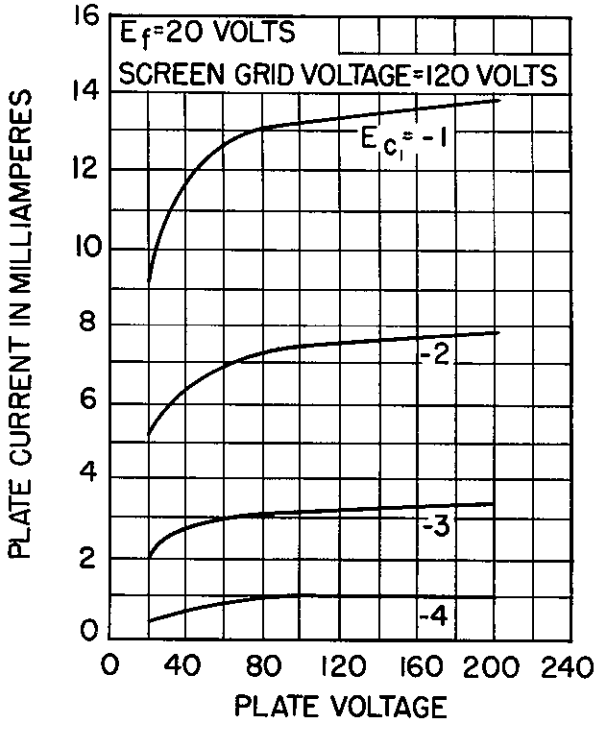
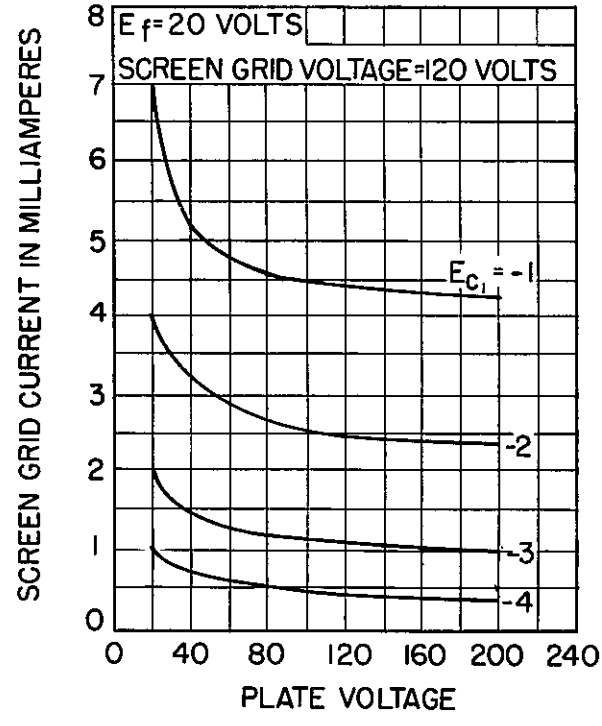


PLATE CURRENT IN MILLIAMPERES
16
14
12
10
8
6
4
2
0
E_f=20 VOLTS
SCREEN GRID VOLTAGE=120 VOLTS
E_{c_1}=-1
-2
-3
-4
0
40
80
120
160
200
240
PLATE VOLTAGE


SCREEN GRID CURRENT IN MILLIAMPERES
8
7
6
5
4
3
2
1
0
E_f=20 VOLTS
SCREEN GRID VOLTAGE=120 VOLTS
E_{c_1}=-1
-2
-3
-4
0
40
80
120
160
200
240
PLATE VOLTAGE

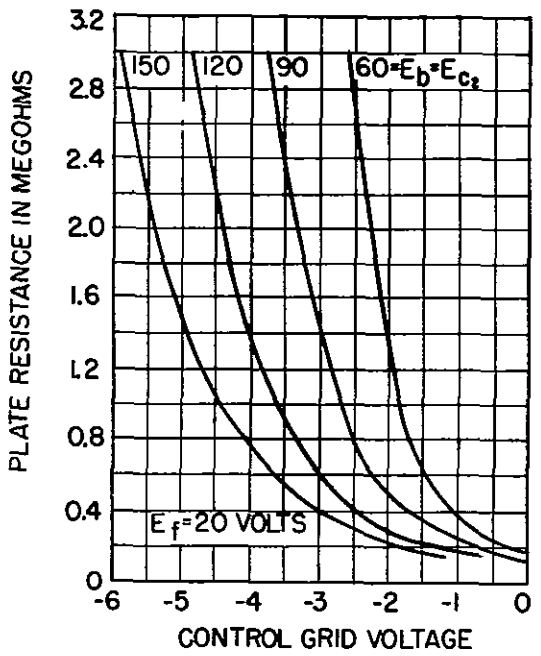
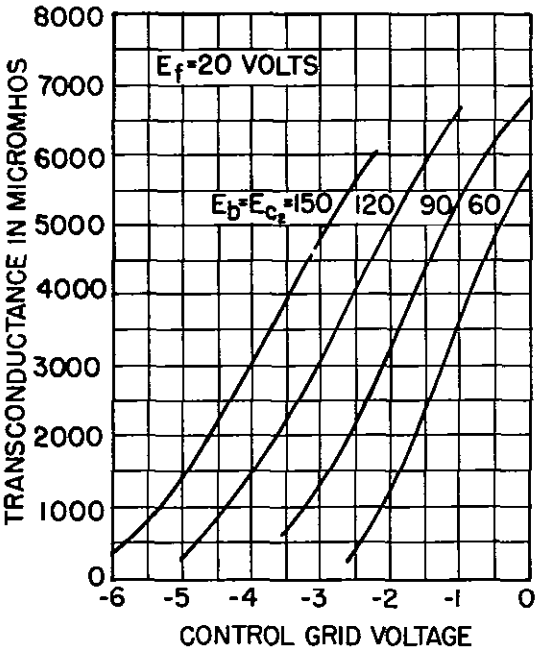
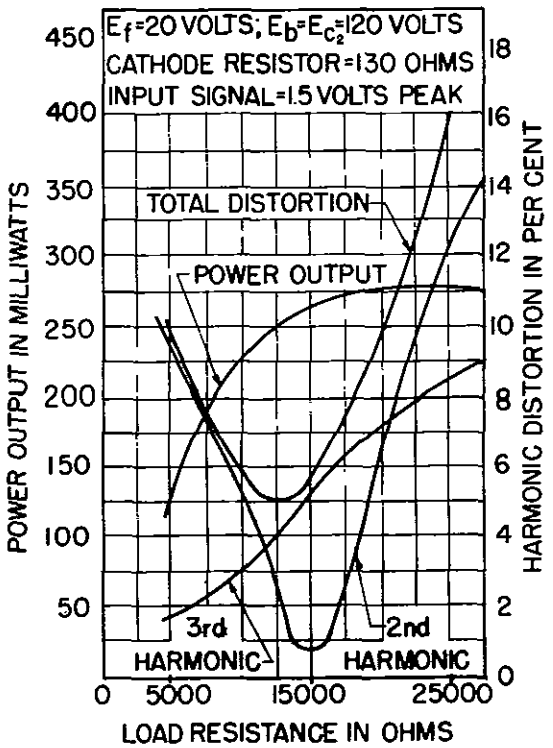
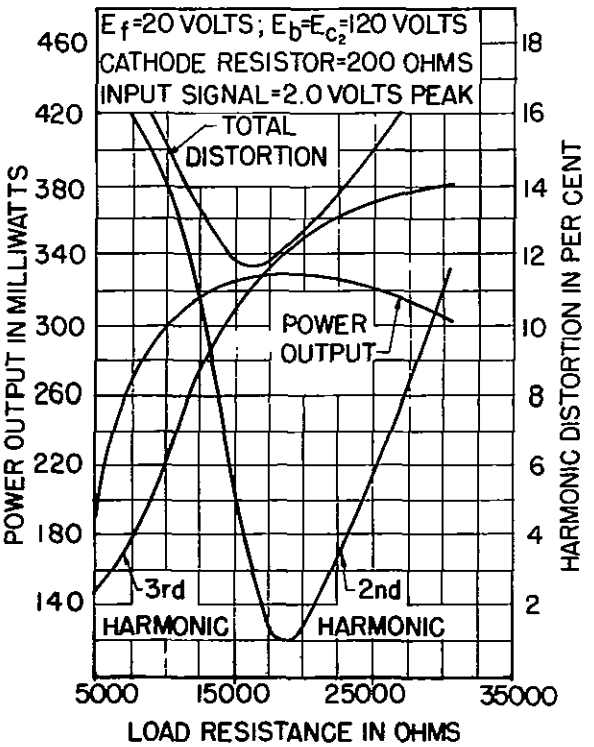
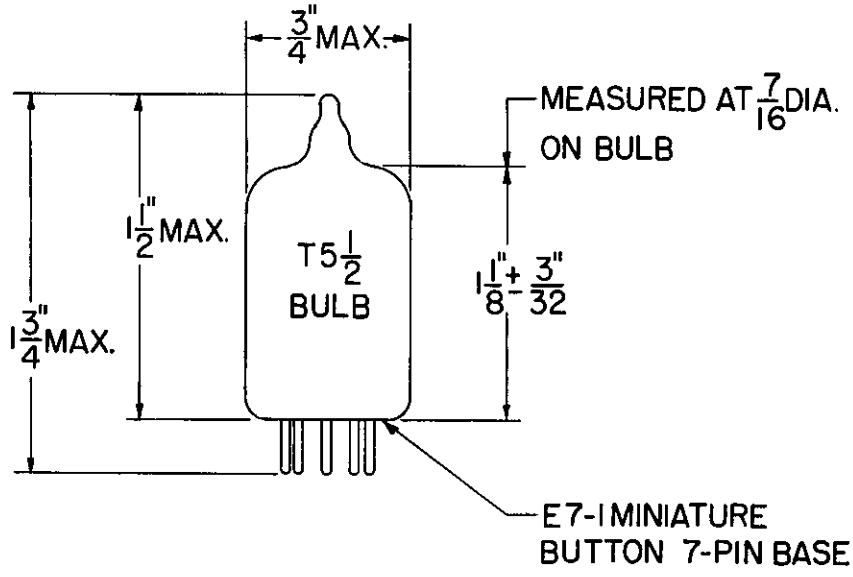


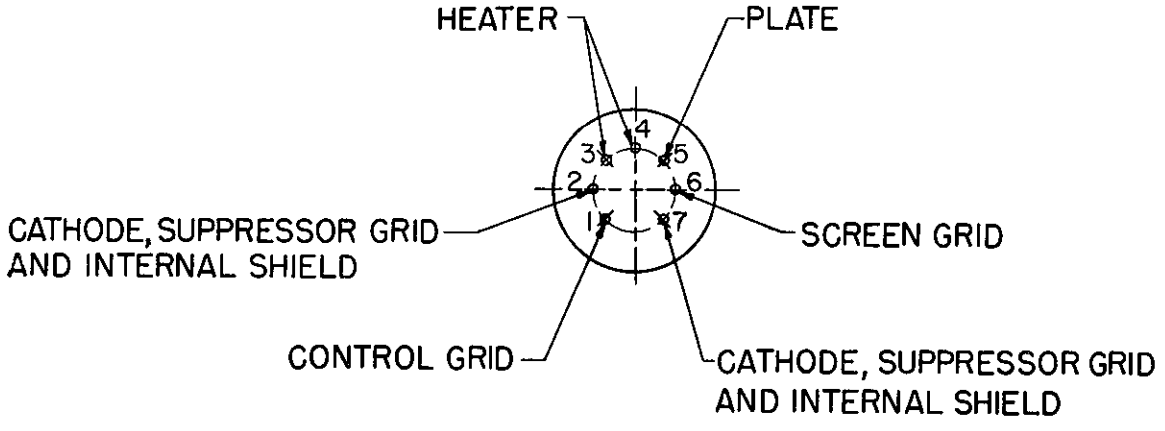
PLATE RESISTANCE IN MEGOHMS
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0
150
120
90
60=Eb=Ec2
Ef=20 VOLTS
-6
-5
-4
-3
-2
-1
0
CONTROL GRID VOLTAGE


TRANSCONDUCTANCE IN MICROMHOS
8000
7000
6000
5000
4000
3000
2000
1000
0
Ef=20 VOLTS
Eb=Ec2=150
120
90
60
-6
-5
-4
-3
-2
-1
0
CONTROL GRID VOLTAGE


Ef=20 VOLTS; Eb=Ec2=120 VOLTS
CATHODE RESISTOR=130 OHMS
INPUT SIGNAL=1.5 VOLTS PEAK
POWER OUTPUT IN MILLIWATTS
450
400
350
300
250
200
150
100
50
TOTAL DISTORTION
POWER OUTPUT
3rd HARMONIC
2nd HARMONIC
HARMONIC DISTORTION IN PER CENT
18
16
14
12
10
8
6
4
2
0
0
5000
15000
25000
LOAD RESISTANCE IN OHMS


Ef=20 VOLTS; Eb=Ec2=120 VOLTS
CATHODE RESISTOR=200 OHMS
INPUT SIGNAL=2.0 VOLTS PEAK
POWER OUTPUT IN MILLIWATTS
460
420
380
340
300
260
220
180
140
TOTAL DISTORTION
POWER OUTPUT
3rd HARMONIC
2nd HARMONIC
HARMONIC DISTORTION IN PER CENT
18
16
14
12
10
8
6
4
2
5000
15000
25000
35000
LOAD RESISTANCE IN OHMS





A development of Bell Telephone Laboratories, the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company.