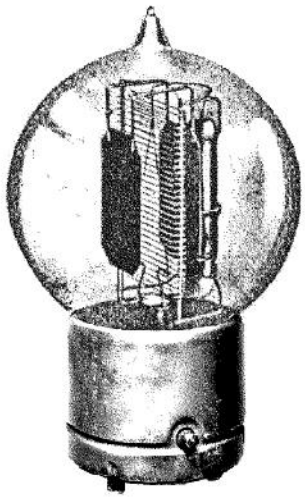
Western Electric

201A/B Vacuum Tube PRELIMINARY

(Type 201A as U.S. Navy type CW-186)



Classification—Filamentary, detector, voltage amplifier triode

The 201A tube is similar to the 102 tube except that grid constructions had thirty-seven laterals on each side instead of thirty-one. This tube had a three-contact base, specified by the Navy, the forth connection (one side of the filament) being made to the bayonet pin (metal base shell). In the standard telephone repeater base this tube was known to the Western Electric Type D and was assigned the code number 201B.

Applications

Audio-frequency voltage amplifier.
Detector or modulator.

Dimensions—Dimensions, outline diagrams of the tube and base, and the arrangement of the electrode connections to the base terminals are shown in Figures 1 through 4.

Base— 201A : Navy, three-contact, bayonet type*(the forth connection being made to the bayonet pin.) having special contact metal at the end of contact pins.

201B : Medium, four-pin, bayonet type having special contact metal at the ends of the contact pins.

* Corroded color of the long-term, was the same as BRASS, but the material was found to be a result of Nickel-silver (German silver) is polished.

Socket— 201A : Navy, three-contact, bayonet-slot type, with bayonet contact, preferably provided with contact-metal contacts. (refer to Figure 6, bottom right of photo)

201B : Four-contact, bayonet-slot type, preferably provided with contact-metal contacts, such as the Western Electric 100L for front of panel mounting or 100R for rear of panel mounting.

Mounting Positions—Either vertical or horizontal. If mounted in a horizontal position, the plane of the filament, which is indicated in Figure 2, Figure 4 should be vertical.

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric Z01A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 102G ISSUE 1" (1936). However, all contents is correct !

Average Direct Interelectrode Capacitances

	A	B	C
Grid to plate, μμf	5.0	5.4	6.5
Grid to filament, μμf	2.9	3.6	5.7
Plate to filament, μμf	1.7	2.4	4.9

Column A—Based tube without socket. (refrence 102G, dataseet value)

Column B—Based tube without socket. (Actual measurement value of an 102G own by itself.

Column C—Based tube without socket. (Actual measurement value of 201A (Nickel-silver base))

*Measurement equipment: hp 4261A LCR Meter, (Test signal Freq.: 1 kHz, Level : 1 Volt)

Filament Rating

Filament current ..... 1.25 ampere, d.c.
Nominal filament voltage ..... 2.5 - 3.0 volts

The filament of this tube is designed to operate on a current basis and should be operated at as near the rated current as is practicable. **Filament Current Must Never Exceed 1.3 Amperes.**

Characteristics—Electrical and mechanical information is refer to Tabular Data 4 : DWG №. ESR-255549 (8-28-29). Plate current characteristics of 1 sample 201A tube are shown in Figure 7 as functions of grid voltage for several values of plate voltage. The grid and plate voltages are measured from the negative end of the filament. Plate current characteristics as functions of plate voltage are shown in Figure 8 for several values of grid voltage.

TABLE (Actual measurement value of 201A - № **36506 D**)

Plate Voltage	Grid Bias	Plate Current	Amplification Factor	Plate Resistance	Transconductance	Input Voltage	Load Resistance	Output Voltage
Volts	Volts	Milliamperes		Ohms r_p	Micromhos	Peak Volts	R	Peak Volts
130	−2.0	0.24	38.1	159000	240	2.0	$R = r_p$	28
							$R = 3r_p$	43
							$R = 5r_p$	49
130	−1.0	0.56	39.8	100000	400	1.0	$R = r_p$	18
							$R = 3r_p$	26
							$R = 5r_p$	29
*160	−3.0	0.21	36.7	180000	200	3.0	$R = r_p$	43
							$R = 3r_p$	62
							$R = 5r_p$	68
*160	−2.0	0.47	38.3	110000	350	2.0	$R = r_p$	33
							$R = 3r_p$	49
							$R = 5r_p$	54
*160	−1.0	0.90	38.7	79000	490	1.0	$R = r_p$	16
							$R = 3r_p$	25
							$R = 5r_p$	28
**190	−3.0	0.41	37.8	122000	310	3.0	$R = r_p$	46
							$R = 3r_p$	69
							$R = 5r_p$	77
**190	−2.0	0.79	38.1	85000	450	2.0	$R = r_p$	35
							$R = 3r_p$	52
							$R = 5r_p$	58
**190	−1.0	1.32	39.1	67000	580	1.0	$R = r_p$	18
							$R = 3r_p$	27
							$R = 5r_p$	30

PRELIMINARY

* Maximum operating conditions.
** This data, for comparing the 201A and 102G, and are measured by exceed the maximum rating intentionally. maximum rating of 201A are E_B (max) : 150 Volts, Max input voltages : 2.5 volts.

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric 201A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 102G ISSUE 1" (1936). However, all contents is correct !

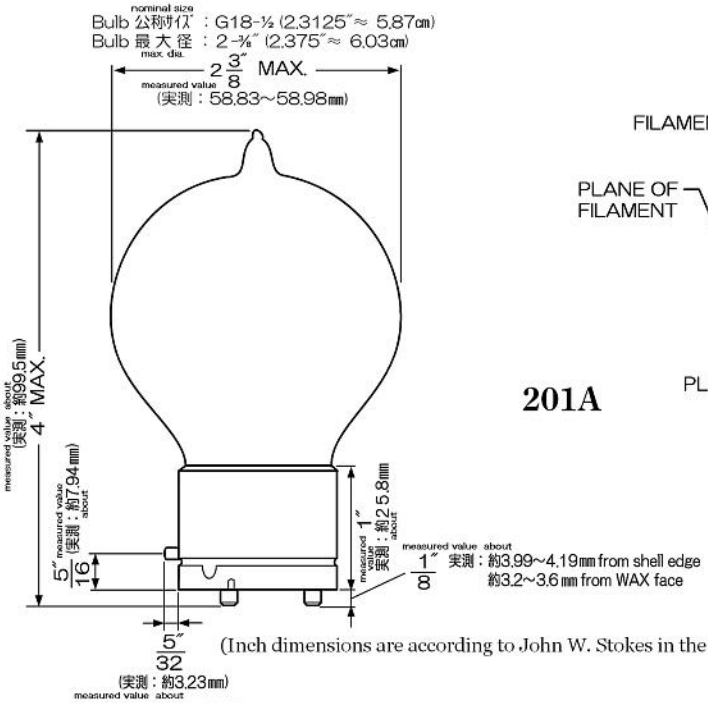


FIG. 1

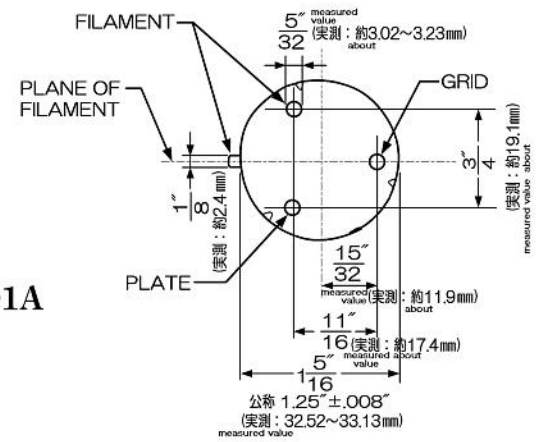


FIG. 2

(Inch dimensions are according to John W. Stokes in the "70 Years of Radio Tubes and Valves".)

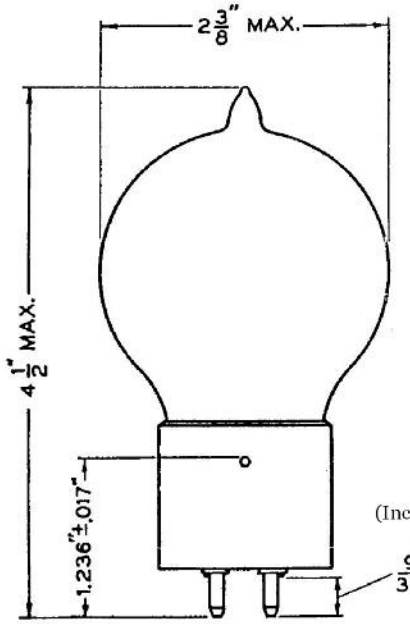


FIG. 3

PRELIMINARY

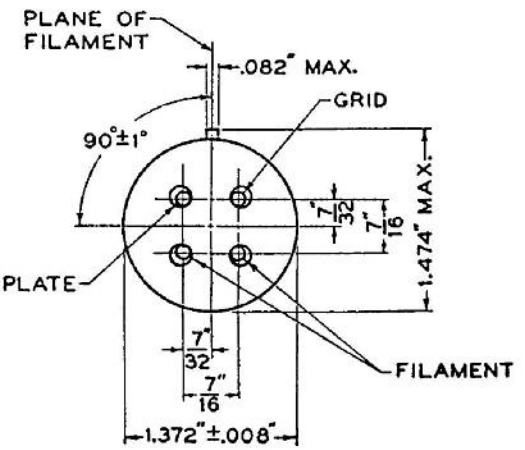


FIG. 4

(Inch dimensions are according to in the "V.T. DATA SHEET 102G ISSUE 1".)

FIG. 5

注:Bulb sizeの『G18-1/2』はむかし電球形状の表記で,文字『G』は電球の形状『Globe(球形)』であることを示している。文字に続く数は,8分の1インチ単位で管径を示したもの。すなわち18-1/2インチで,1/8×18.5(18.5/18)インチの直径であることを示している。普通に書けば,公法で59㎜程度,ヤード・ポンド"法における 2-5/16インチ。

NOTE : BULB SIZE "G18-1/2" in the notation of the old days, the letter "G" is bulb shape indicates that the "Globe (spherical)". The number that follows the letter, within the indicates diameter of the bulb in one-eighth inch units. i.e. show that with 18-1/2 inch have 1/8×18.5 (18.5/18) inches diameter. When denoting normally, 2-5/16 inches in imperial system, about 59mm in metric system.

ちなみに,普通の電球は『A』型。『A』という文字に特別な意味は無いようだが,形状は『洋梨型』と呼ばれる。A型の『首』の部分が長く直ぐに長いのを『PS』型というが,日本では明確では無いらしい。また,日本では,なぜか『茄子型』電球というとこれを指す。

Incidentally, an ordinary light bulb "A" type. There does not seem special meaning to the letter "A", but the shape is called a "Pear Shaped" light bulb. Is referred to as "PS" type part of the "A" type of "neck" is a long straight, but does not seem to have clear in Japan. Also, in Japan, refers to this when say "eggplant" bulb.

古物電球に見られる形状は『S』型と呼ばれる。所以は『Straight side』ということだ。RCAの『UX-201A』等,ST管以前を代表する同形状管も同じ。こちらも,衰空管マニアの間では『茄子型』と呼ばれるのは有名。

Shape can be seen in antique bulb is referred to as the "S" type. Why's that "Straight side". The shape of the tube ST tube before such as "201A" of the RCA is also the same.

同じく古物電球に見られる形状は『T』型と呼ばれる。所以は『Tubular shape(筒型)』ということだ。RCAの"199"や"120"等の同形状管も同じ。小さい方は←日本では『ナツメ球』と呼ばれる。

Shape can be seen in the same antique bulb is referred to as a "T" type. "Tubular shape (cylindrical)" why's that. Same shape tube such as "199" or "120" in the RCA also the same. The small bulb, called "jujube bulb" in Japan.

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric Z01A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 10ZG ISSUE 1" (1936). However, all contents is correct !

WESTERN ELECTRIC COMPANY, INCORPORATED
ENGINEERING DEPARTMENT
NEW YORK, U. S. A.

Sketch No. ES164202

TYPE	PLATES	PLATE SPACING	GRID SPACING	GRID WIRES	FILAMENT LENGTH	I_A	E_B	I_B	μ_0	R_0	USE
D	1⅛" x ⅝" 161083	¼"	⅛"	.37 x 2 161083	2⅜"	1.3	150	4 mil.	40		Detector

Tabular Data 1 : Sketch No. ES-164202 (1918)

TYPE	A.T.&T. CODE NO.	ARMY CODE	NAVY CODE	DESCRIPTION	SPECIFICATIONS 164508						
					PLATES	GRIDS	PLATE SPACING	GRID SPACING	GRID WIRES	FILAMENT	BULB
D	201 A 201 B			THREE CONTACT BASE FOUR	1⅛" x ⅝" 161083	1⅛" x ⅝" 161083	¼" 161473	⅛" 161478	.37 x 2 161083	2 2/8"	G 18½

Tabular Data 2 : Sketch No. ES-164508 (1918)

ES-Z71024
Dr. 1

Issue 3
Nov. 1922

VACUUM TUBES AND VACUUM TUBE SOCKETS

For reference only. Subject to change without notice.

NOTE:
All repeater bulbs and repeater bulb sockets are known, now, as vacuum tubes and vacuum tube sockets respectively. Vacuum tubes designed for use by the A.T.& T. and Associated Bell Companies either as repeaters, oscillators, or modulators will be referred to as vacuum tubes.

7 copies for Mr. J.L. McQuarrie (3 for Mr. Gill. 3 for Mr. W.C. Adams.

LABORATORY DESIGNATION	CODE NUMBERS: W. E. CODE NUM. - A3900	CODE NUMBERS: A3900	CODE NUMBERS: ARMY CODE	CODE NUMBERS: NAVY CODE	STATUS	REMARKS	USED AS	VACUUM TUBE SOCKETS: CODE NUMBER	VACUUM TUBE SOCKETS: STATUS	VACUUM TUBE SOCKETS: REMARKS
D	201-A			CW-186	Obsolete	Has no property marking. Three point contact to fit U.S. Navy sockets.	Voltage Amplifier Detector	Never Standardized by W.E. Co.		Preliminary design of 3 point socket shown on Es-169810. Only samples made.

Tabular Data 3 : Sketch No. ES-Z71024 (Issue 3 Nov.1922)

注：3接点ソケットの実際の形状は，Fig.6 を参照。（写真の右下）
NOTE : The actual shape of the three-conductor socket, see Fig.6, (Bottom right of the photo)

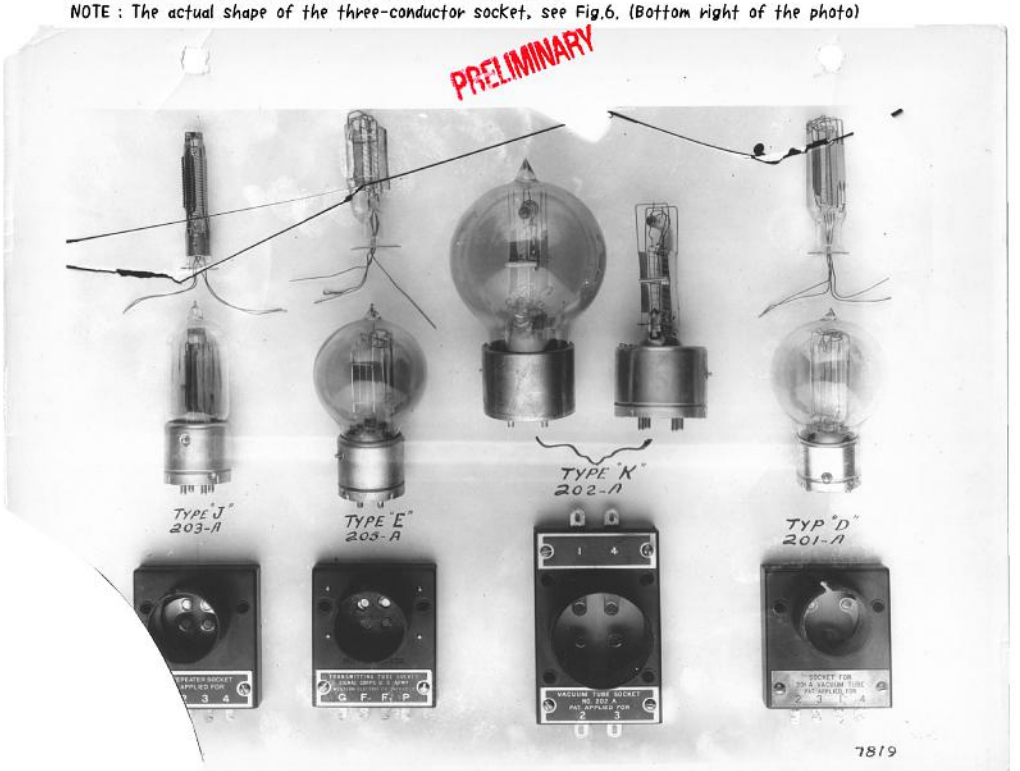


FIG. 6

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric Z01A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 102G ISSUE 1" (1936). However, all contents is correct !

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LAB. TYPE NO.	CODE NUMBERS W.E. CODE	A.T.&T. CODE	ARMY CODE	NAVY CODE	SPEC. NO	DRAWING NO	PHOTO NO	BULB	SOCKET	USES	I_A AMPS	E_A VOLTS	E_B NORM VOLTS	E_B MAX. VOLTS	I_B MILS NORM ①	E_C VOLTS	μ	MAX. INPUT VOLTS
D	201 A			CW 186	M 3030		8737	G 18½	NOT STANDARD	VOLTAGE AMPLIFIER DETECTOR	1.25	2.5-3.0	100	150	.4-9.0	0-1.5	37-44	2.5
D	201 B						8720-A	G 18½	203 B W.E. STAND.	VOLTAGE AMPLIFIER DETECTOR	1.25	2.5-3.0	100	150	.4-9.0	0-1.5	37-44	2.5

20	21	22	23	24	25	26	27	28	29	30
IMPED. R_o ②	POWER	REMARKS	PLATES	GRIDS	PLATE SPACING	GRID SPACING	GRID WIRES	FILAMENT	BASE	LAB. TYPE NO.
70,000-100,000		OBS- METAL SHELL IS ONE TERMINAL CONNECTION.	1⅞ X ⅝ 161083	1⅝ X ⅞ 161083	1/2 161473	1/4 161473	37 X 2 161083	2¾	3 CONTACT	D
70,000-100,000		OBS- REPLACED BY TYPE V.	1⅞ X ⅝ 161083	1⅝ X ⅞ 161083	1/2 161473	1/4 161473	37 X 2 161083	2¾	4 CONTACT	D

ISSUE 3 8-28-29 APP'D
ALTERED FROM ESR-255549, 12 MAR 3, WITHOUT CHANGE
ISSUE 4 8-28-29

NOTES:
① PLATE CURRENTS (I_B) GIVEN ARE FOR NORMAL PLATE VOLTAGE (E_B) AND ZERO GRID POTENTIAL (E_C).
② IMPEDANCES (R_o) GIVEN ARE FOR NORMAL PLATE VOLTAGE (E_B) AND ZERO GRID POTENTIAL (E_C).
③ OTHER PLATE VOLTAGES TO 200% MAY BE USED WHEN PROPER ADJUSTMENTS OF THE GRID POTENTIAL ARE MADE.
④ 205-A LICENSED FOR GOVERNMENTAL COMMUNICATION PURPOSES IN

NOTE: THIS DRAWING FOR USE IN DEPT 220 ONLY.

VACUUM TUBE INFORMATION

30144 SCALE —
APPROVED — DRAWN BY R.B.L. CHECKED BY — TRACED BY A.B.E. ENGINEER R.B.L.
BELL TELEPHONE LABORATORIES, INC. NEW YORK

ESR-255549

ESR-255549

注：この資料は、Western Electric Z01-A の規格を紹介するために、JL1ORW/T.Kishimotoが、④番から Type D (Z01A, Z01B) に関係する部分を抜粋したもの。出典が判るように、④番のタイトル及び版数欄は修正した。
NOTE : This Tabular Data is introduce a specifications of Western Electric Z01-A tube, excerpt pertinent portions to Type D (Z01A, Z01B) from the drawing, by JL1ORW/T.Kishimoto.
Source to As is apparent, I left the edition number field and the title of the drawing.

Tabular Data 4 : Drawing No. ESR-Z55549 (Issue 4 8-Z8-Z9)

PRELIMINARY

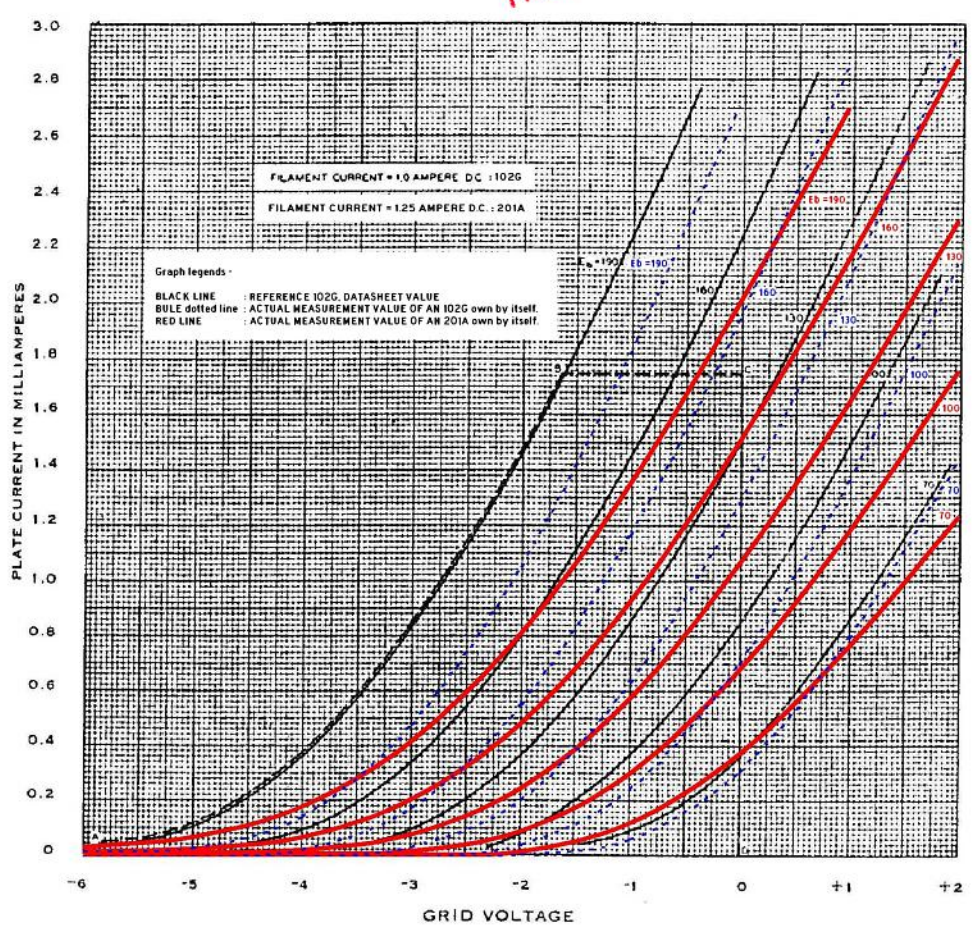


FIG. 7

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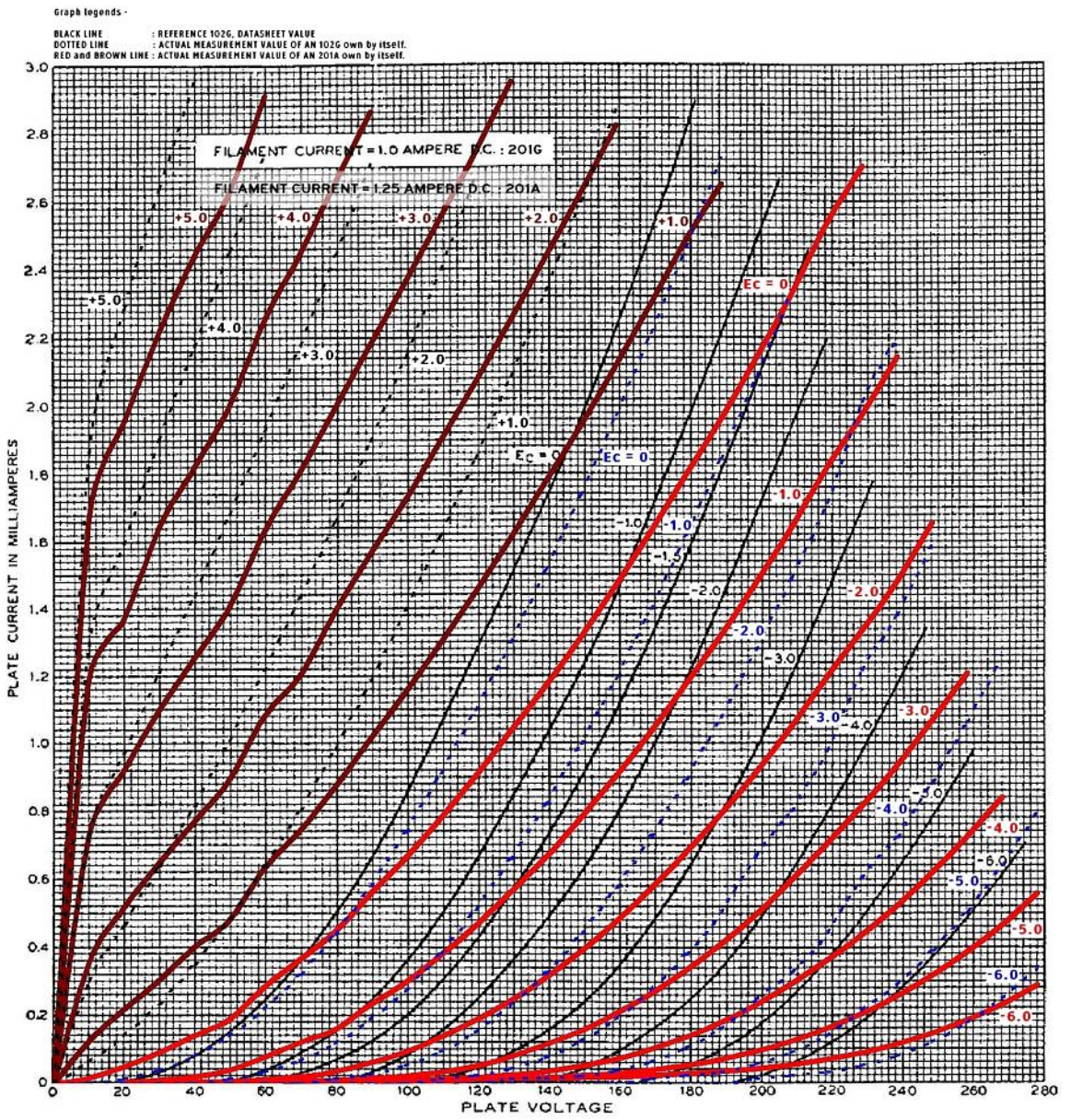

FIG. 8

PRELIMINARY

Source : 1) Gerald F.J. Tyne 『Saga of the Vacuum Tube』
2) John W. Stokes 『70 Years of Radio Tubes and Valves』
3) 『The Complete Western Electric Vacuum Tube Library』 by James Cross
4) 『V.T. DATA SHEET 102G, ISSUE 1』 BELL Telephone Lab (A.T. & T) and Western Electric Company
5) 『Western Electric Type Z01A』 Reverse Time Page, Mike Schultz (http://uvZ01.com/Tube_Pages/we_Z01a.htm)
6) 『West. Elect. Z01-A』 Bill's Vintage tube Site, Bill Condon (http://www.bill01a.com/tubephotos/we-Z01a.htm)
7) 『W.E. tubes Part 1』 TUBE & VALVE GALLERY, EU VALVE (http://www3.osk.3web.ne.jp/~euvalve/gallery/wepart1.html)
8) 『森空管 [01A森空管]物語』 JA2OP, JA1KGW/高山健太郎さんのhp 森空管顛末記 (http://homepage2.nifty.com/kawoyama/tubestory01atube.html)

1-C-36-3M
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A development of Bell Telephone Laboratories, Incorporated, the research laboratories of the American Telephone and Telegraph Company, and the Western Electric Company

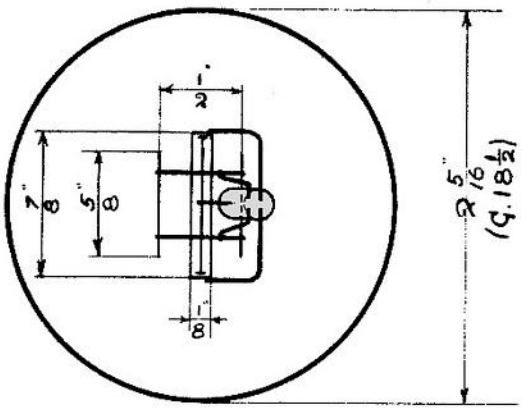
V. T. DATA SHEET 102G
ISSUE 1

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric Z01A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 102G ISSUE 1" (1936). However, all contents is correct !

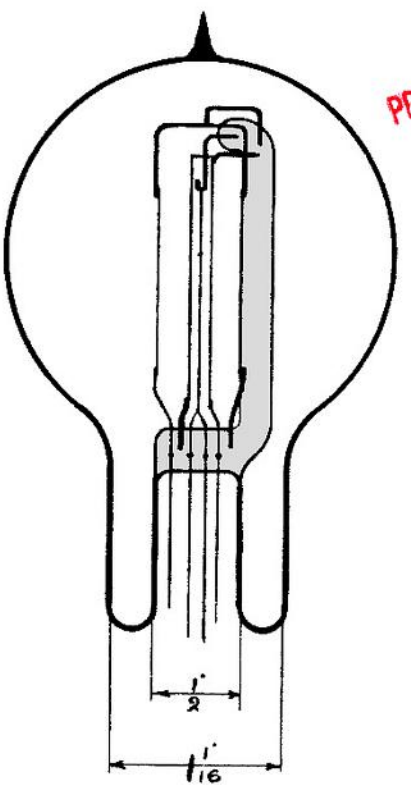
APPENDIX A

WESTERN ELECTRIC COMPANY, INCORPORATED
ENGINEERING DEPARTMENT
NEW YORK, U. S. A.

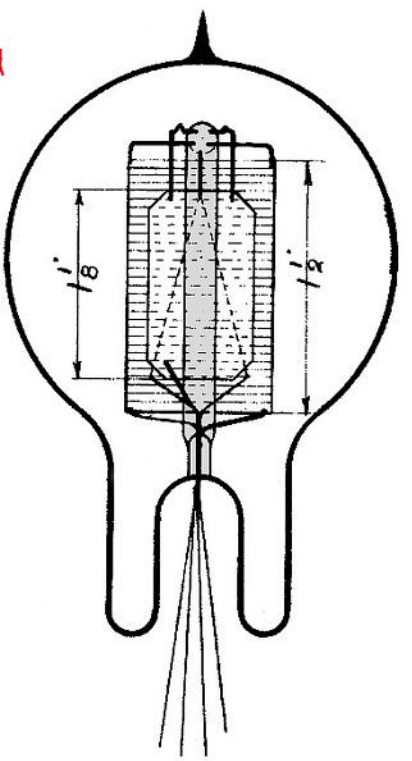
Sketch No. **ES-161473**



GRID	31 X 2
ANCHOR WIRES	.015" NICKEL
FILAMENT	E.η
SUPPORT ROD	3/16" DIAM.



PRELIMINARY



TYPE V -VACUUM TUBE.

WJL
RFT.

TYPE "D" SAME AS "V" EXCEPT GRID IS 37 X 2

SCALE - FULL SIZE

FIG. 9

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric Z01A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 10ZG ISSUE 1" (1936). However, all contents is correct !

APPENDIX B

WESTERN ELECTRIC COMPANY, NEW YORK, U. S. A.
ENGINEERING DEPARTMENT

Sketch No. ES/61083

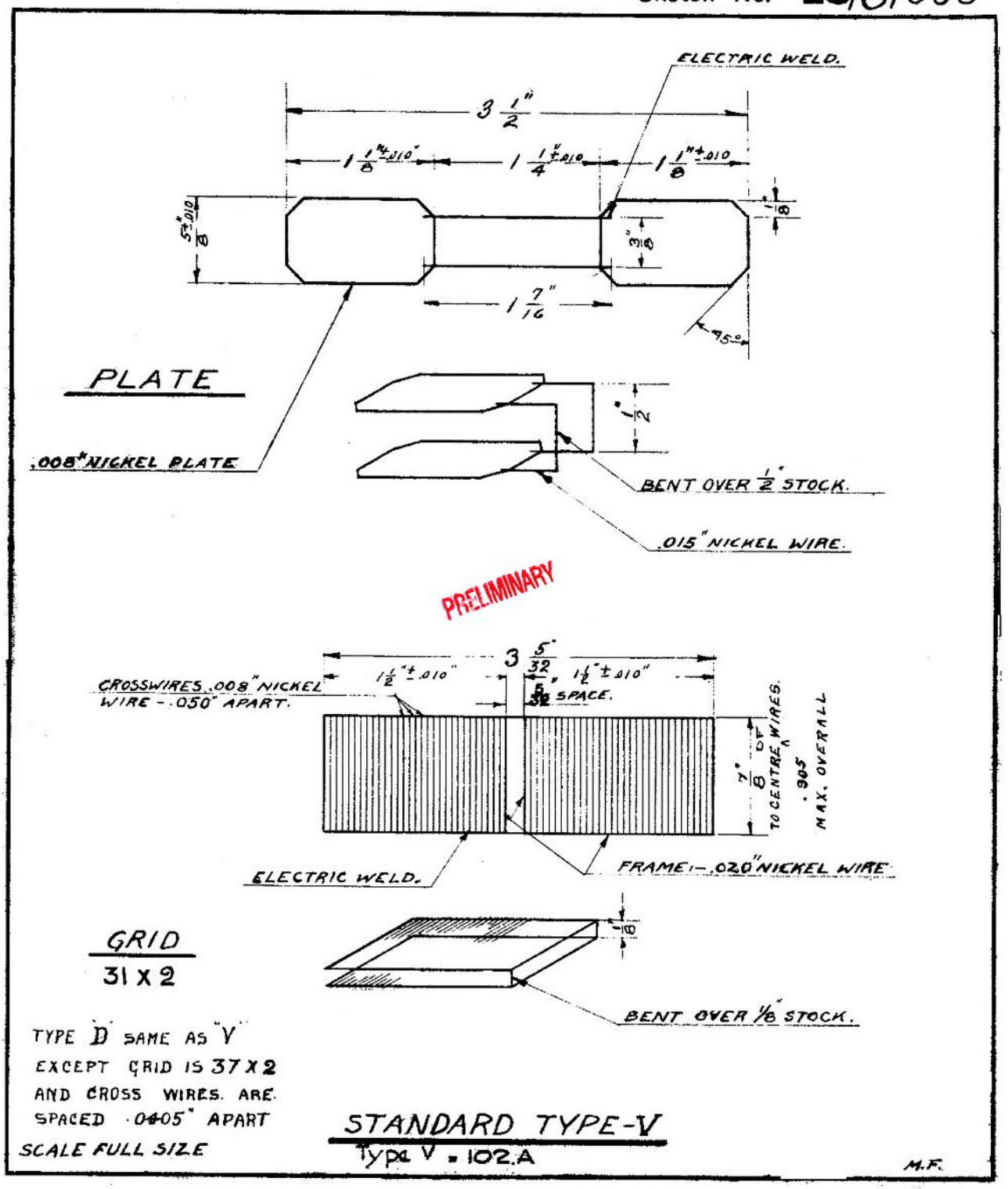


FIG. 10

Note: This data sheet was, does not actually exist. This data is the result of investigating Western Electric 201A owned by itself, and data of literature are gathered in the format, similar to "Western Electric V.T. DATA SHEET 102G ISSUE 1" (1936). However, all contents is correct !

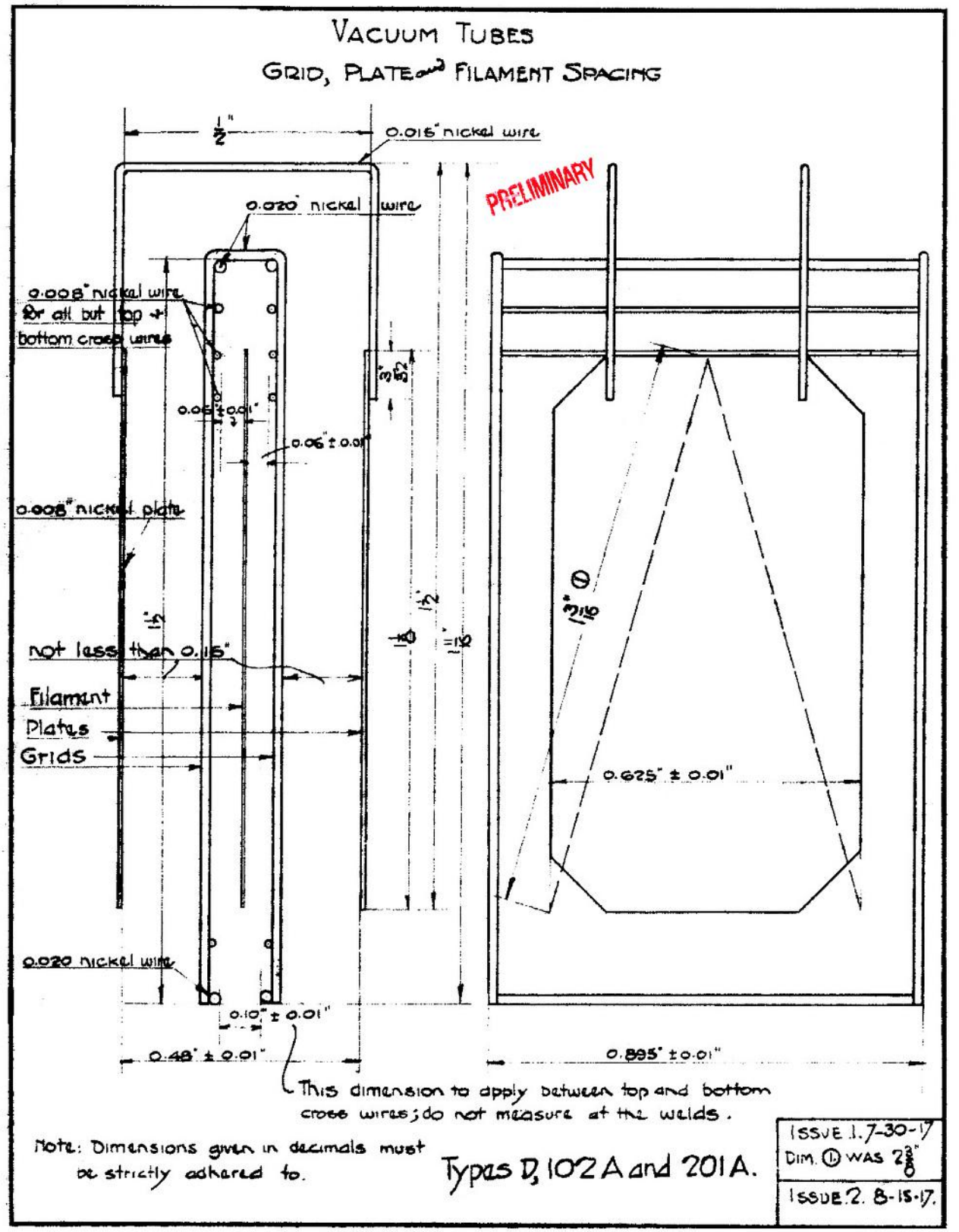
APPENDIX C

WESTERN ELECTRIC COMPANY, INCORPORATED
ENGINEERING DEPARTMENT
NEW YORK, U. S. A.

Sketch No. ES 162581

VACUUM TUBES

GRID, PLATE and FILAMENT SPACING



Note: Dimensions given in decimals must be strictly adhered to.

Types D, 102A and 201A.

ISSUE 1. 7-30-17
Dim. ① WAS 2 3/8"
ISSUE 2. 8-15-17.

FIG. 11