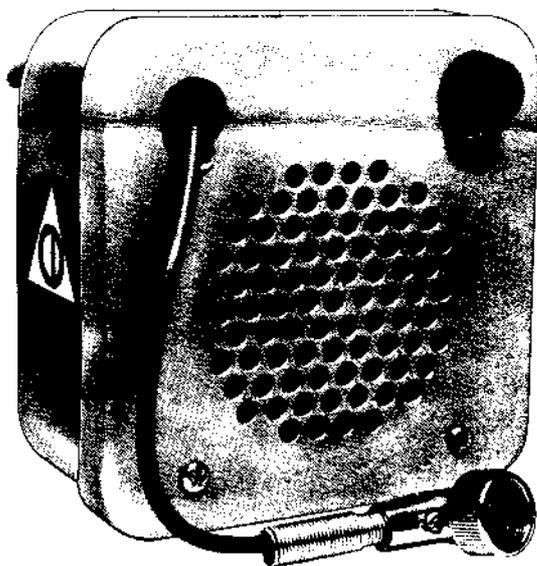


Instruction and Maintenance Manual

LOUDSPEAKER

OCD Item No. CD V-705, Model No. 2
Manufactured 1966



U N I V E R S I T Y S O U N D
9500 W. Reno, Oklahoma City, Oklahoma 73101

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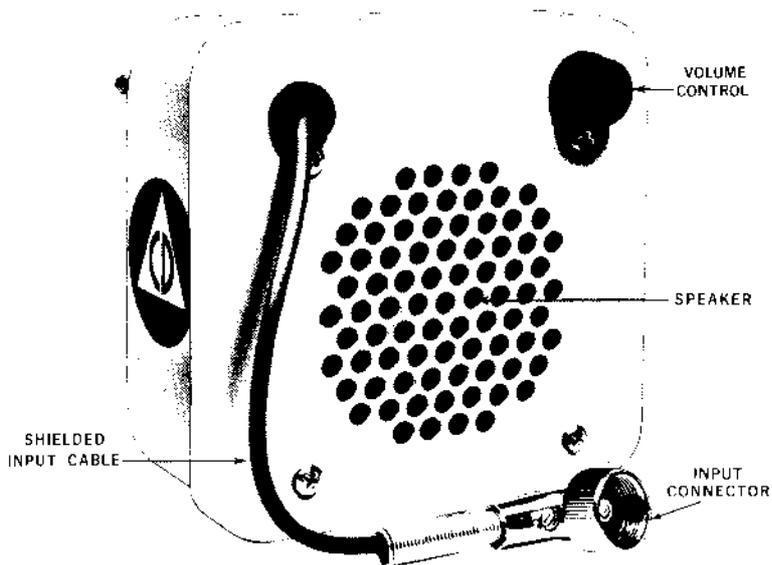


Figure 1.a Front View of University Sound CD V-705, Model No. 2

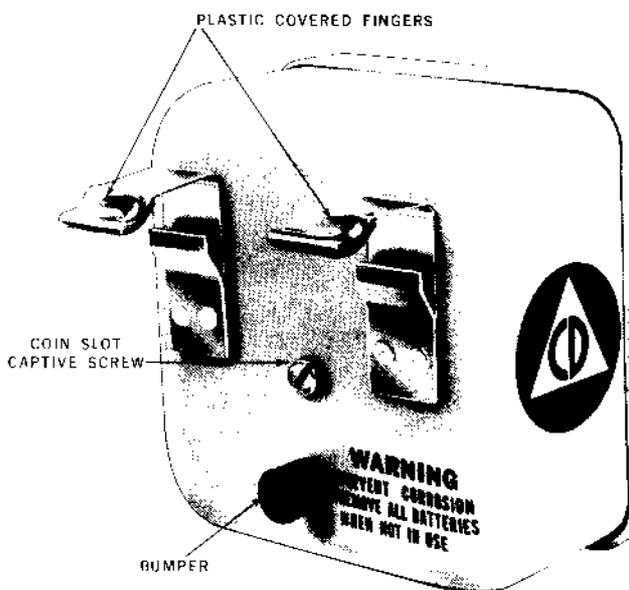


Figure 1.b Rear View of University Sound CD V-705, Model No. 2

1. PRECAUTIONS

1.1 Precautions:

This instrument is operated from two "D" cells. As there is no "Off-On" switch, these cells should be inserted only when the device is intended for operation. The cells should be removed at the conclusion of operation both to conserve battery life and to protect the instrument from leaky batteries, which should never be used. No high voltage exists in the unit; thus the CD V-705 Loudspeaker Attachment may be operated, serviced, or repaired without danger to the operator or repair technician.

2. GENERAL DESCRIPTION

2.1 Introduction:

This instrument is a loudspeaker attachment for the CD V-700 Geiger Counter Survey Meter and is essentially a training aid to amplify the pulses usually heard in the CD V-700 headphone and make them audible to a group of people.

2.2 Operations:

The signal from the CD V-700, usually heard by means of a headphone as a distinctively audible "click", is in the form of an electrical pulse. When no signal is received by the CD V-705, no sound emits from its loudspeaker. Upon receiving the signal pulse, the instrument produces an audible click much like that of the CD V-700, making one such click for each signal pulse received. The volume, (loudness of the sound), is controllable by the control knob located on the front of the cabinet. Adjustments of the loudness in no way affect the frequency, (rate of response of the unit to signals from the CD V-700.) There is no warm-up period and the instrument will respond to the first pulse delivered by the CD V-700, when connected and with the batteries in place.

3. THEORY OF OPERATION

3.1 Introduction:

The CD V-705 consists of trigger transistor Q2, amplifier transistors Q3 and Q4, and trigger cut off transistor Q1, plus associated resistors and capacitors coupled to a speaker of 3.2 ohms impedance (refer to schematic drawing). The power source is a series arrangement of two 1 1/2 volt cells providing a nominal 3 volts

for operation. The circuit is contained on a single printed circuit board. Batteries are held by a plastic box, and are accessible by turning the coin-slot screw in the rear of the unit and removing the outer rear cover. The only adjustment is that of the volume control knob on the front of the instrument. Input connection is made by means of a shielded lead terminated by a standard connector fitting the headphone output of the CD V-700.

3.2 Circuit Description:

Signal pulses delivered by the CD V-700 to plug P1 arrive at the base of Q2 via C1 and R1. Pulses of sufficient amplitude cause Q2 to be momentarily biased to conduction. Current flow through its collector circuit, R4, causes Q3 to be biased "on". The resultant collector current of Q3 through R7 causes the junction point of R7 and Q3 to become more negative; this voltage applied to the base of Q2 results in a regenerative condition. The same voltage applied to the base of Q1 causes Q1 to conduct, turning off Q2. The difference in the values of R3 and R2, plus the charging time of C2, causes the cut-off to occur just after regeneration begins, this signal appearing across the volume control R6. The signal is then direct coupled to the base of Q4, and is amplified and coupled to the speaker, producing an audible "click".

4. INSTALLATION

4.1 Cover Removal:

Unscrew captive coin-slot screw in instrument rear cover. Remove cover; screw will remain in cover.

4.2 Battery Placement:

Two size "D" NEDA 13 cells are to be placed in the battery compartment. The compartment has a snap type lock and hinged lid. Observe polarity of cells; they will fit in the battery compartment only in the correct way. The positive (+) terminal is the end of the cell having the button-like post. Close lid and replace instrument rear cover, tightening screw to hold in place.

4.3 Installation:

The plastic covered fingers of the CD V-705 are placed on the left-hand top edge of the CD V-700, with the main body to the left of the counter. Pushing down on the CD V-705 will allow the short fingers to enter the space between the cover and the box of the counter. Removal may be accomplished in the same manner. The cable of the CD V-705 is then connected to the headphone connector of the CD V-700.

5. OPERATION

5.1 Operation:

Turn volume control knob clockwise. The CD V-705 will then respond to signals from the CD V-700 in the same manner as the head-phone, with maximum volume. Sound level may be adjusted by control knob while listening to pulse signals generated by the CD V-700.

6. OPERATOR'S MAINTENANCE

6.1 Operator's Maintenance

Nominal no-signal battery drain does not exceed 50 microamperes; however, shelf-life and service conditions are an important factor in battery life. Batteries should be replaced if doubtful, if showing signs of leaking, or if measured voltage in an operating CD V-705 is less than 0.9 volts. Fresh cells should operate the CD V-705 a minimum of 200 hours with a pulse rate of 80 pulses per second. NEDA Type 13 cells are specified.

7. PREVENTIVE MAINTENANCE

7.1 Preventive Maintenance

The only preventive maintenance required is removal of the batteries when the loudspeaker attachment is to be stored, and cleaning the battery contacts if they appear corroded.

8. CORRECTIVE MAINTENANCE

8.1 Corrective Maintenance

All resistors and capacitors are identified by standard color code or printed values. They may be replaced by similar parts of equal value, taking usual precautions when replacing components on a printed circuit board. The recommended way of locating defective components is by use of a 20,000 ohms-per-volt Voltmeter, referring to Section 3.2 above and the schematic as a circuit guide.

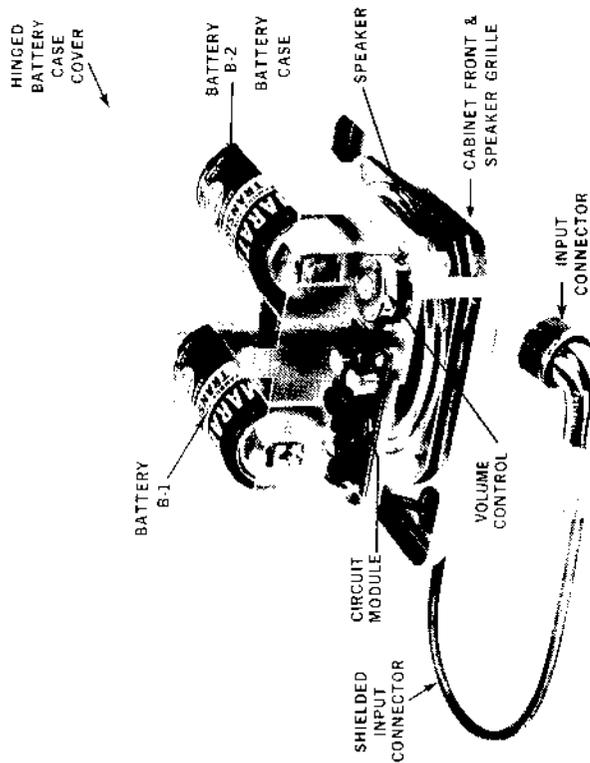
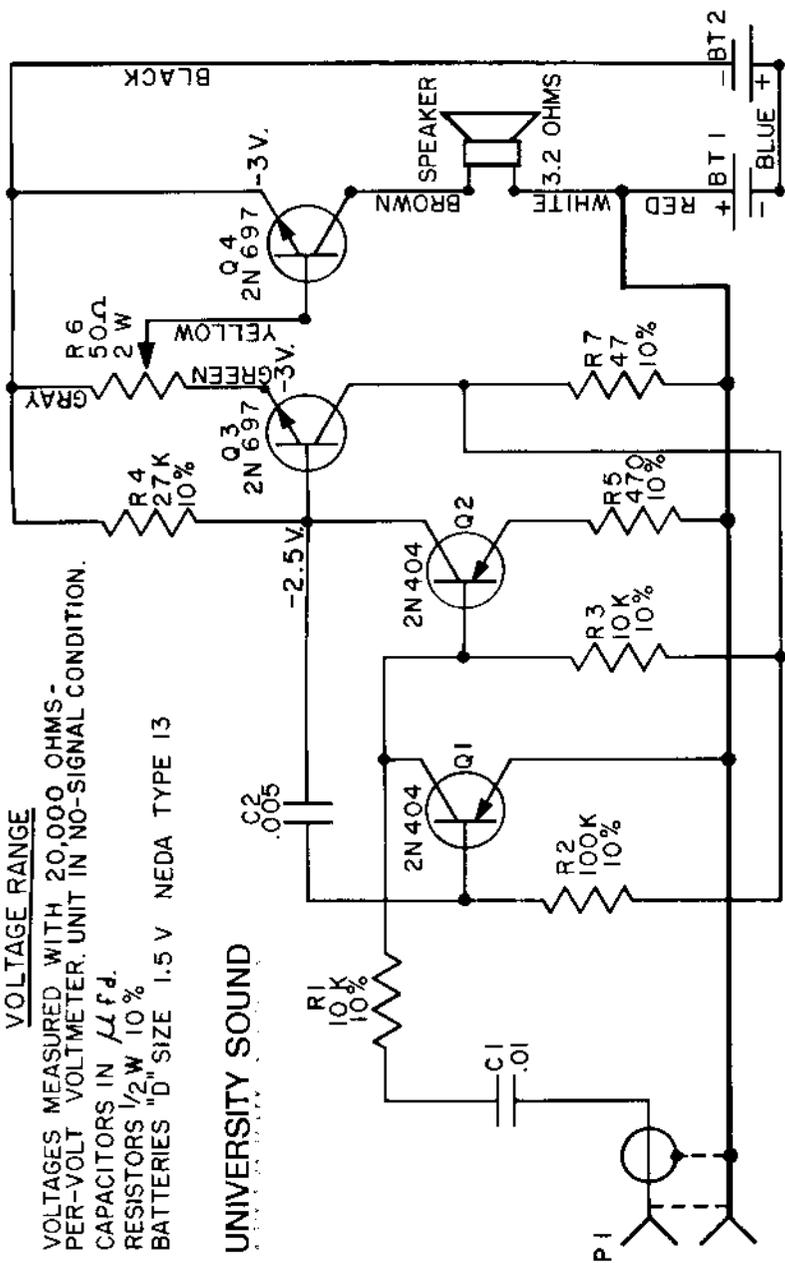


Figure 2 View of University Sound CD V-705, Model No. 2 showing internal elements and battery case

VOLTAGE RANGE

VOLTAGES MEASURED WITH 20,000 OHMS -
PER-VOLT VOLTMETER, UNIT IN NO-SIGNAL CONDITION.
CAPACITORS IN μ f.d.
RESISTORS $1/2$ W 10%
BATTERIES "D" SIZE 1.5 V NEDA TYPE 13

UNIVERSITY SOUND



87 C 93 (B)

Figure 3 CD V-705, Model No. 2 Schematic circuit diagram

9. REPLACEABLE PART LIST

9.1 Electrical Components:

Circuit Symbol	Description	Function	Manufacturer	Manufacturer's Part No.	University Part No.	Quantity Per Unit
BT1	Battery: 1.5v NEDA 13	Power Supply Battery	Marathon	123	80C216-1	2
BT2	Same as BT1	Power Supply Battery	--	--	--	--
C1	Capacitor: .01 MFD 50V	Coupling Capacitor	Sprague	19C214A6	80C3-6	1
C2	Capacitor: .005 MFD 50V	Delaying Capacitor	Sprague	40C172A5	80C3-7	1
R1	Resistor: 10K ohm 1/2W 10%	Coupling Resistor	Allen-Bradley	--	80C10-8	2
R2	Resistor: 100K ohm 1/2W 10%	Biasing Resistor (Q1)	Allen-Bradley	--	80C10-55	1
R3	Resistor: Same as R1	Biasing Resistor (Q2)	--	--	--	--
R4	Resistor: 27K 1/2W 10%	Biasing Resistor (Q3)	Allen-Bradley	--	80C10-10	1
R5	Resistor: 470 ohm 1/2W 10%	Emitter Resistor (Q2)	Allen-Bradley	--	80C10-4	1
R6	Resistor: 50 ohm 2W Potentiometer	Emitter Resistor (Q3) & Volume Control	CTS Corp.	BH 51718	80C14-20	1
R7	Resistor: 47 ohm 1/2W 10%	Biasing Resistor (Q1,2,3)	Allen-Bradley	--	80C10-61	1
Q1	Transistor: 2N404	Trigger Cut-Off	General Electric	--	80C20-13	2
Q2	Transistor: Same as Q1	Trigger Transistor	--	--	--	--
Q3	Transistor: 2N697	Amplifier-Driver	Continental Devices	--	80C20-12	2
Q4	Transistor: Same as Q3	Output Transistor	--	--	--	--
Speaker	Loudspeaker	Produces Audio Signal	University	--	87C88	1
P1	Cable - 10 inches	Connects Unit to Counter	Columbia Wire	1369	81B140	1
P1	Input Plug	Connects Unit to Counter	Amphenol	75-MC-1FA	80A217	1

9.2 Mechanical Components:

Description	Function	Manufacturer	Manufacturer's Part No.	University Part No.	Quantity Per Unit
Battery Box	Holds Battery	University	--	87D89-1	1
Battery Box Lid	Holds Battery	University	--	87C90	1
Case - Front	Holds Speaker & Components	--	--	87C84-1	1
Case - Rear	Houses Components	University	--	87B85-1	1
Gasket	Retards entrance of dirt and moisture	University	--	87B83	1
Spring Clip	Mounting Hardware	University	--	87B87-1	2
Hanger Bracket		University	--	87B86-1	2
Label, Circuit	Circuit Diagram	University	--	87C93 (B)	1
CD Circle Decal	Identification	University	--	87B92	1
Knob	Volume Control Knob	University	--	84C3-9	1
Strain Relief Clamp	Secures Input Cable to case	Heyman	SR-5-P1	84C21-10	1
Screw, Coin Slot 8-32 x 1-1/8	Holds front & rear case together	University	--	--	1
P. C. Board	Holds Electrical Components	University	--	87C91	1
Bumper		Atlantic India	1178-3	87A96	1

9.2 Mechanical Components (Cont'd)

Description	Function	Manufacturer	Manufacturer's Part No.	University Part No.	Quantity Per Unit
Manual	Operating Instructions	University	--	78 X 541	2
Decal - Warning	Instruction	University	--	87B94	1
Battery Contacts	Contacts Battery Terminals	Tinnerman	C41592-012-113	87A95	4
Lead Wire #22		University	Green 2-1/4"	81C139-35	1
Lead Wire #22		University	Yellow 1-3/4"	81C139-34	1
Lead Wire #22		University	Grey 1-1/4"	81C139-33	1
Lead Wire #22		University	Black 6"	81C139-36	1
Lead Wire #22		University	Brown 2"	81C139-32	1
Lead Wire #22		University	White 2"	81C139-31	1
Lead Wire #22		University	Red 1-3/8"	81C139-30	1
Lead Wire #22		University	Blue 8"	81C139-37	1
Transistor Pad		Delbert Blinn Co.	NPT-404-340	72A260	4
Rivet 1/8 x 9/32 Rd Hd		University	--	84C10-13	4
Captive Washer		University	--	--	1
Screw # 4 x 1/4 Type B Ph Pan Hd. Cd. Pl.		University	--	--	4
Screw # 6 x 1/2 Type B Ph Pan Hd. Cd. Pl.		University	--	--	4

9.3 List of Manufacturers:

Allen - Bradley Company
136 West Greenfield Avenue
Milwaukee, Wis.

Amphenol - Borg Electronic Corp.
811 S. Central Expressway
Richardson, Texas

Atlantic India Rubber Company
571 West Polk Street
Chicago, Ill.

Delbert Blinn Company
1678 East 5th
Pomona, California

Columbia Wire & Supply Company
2854 West Irving Park Blvd.
Chicago, Ill.

Continental Device Corporation
12515 Chadron Avenue
Hawthorne, California

C T S of Berne
Berne, Indiana

General Electric Company
8101 Stemmons Freeway
Dallas, Texas

Heyman Mfg. Company
Kenilworth, New Jersey

Marathon Battery Company
840 Henrietta Street
Wausau, Wisc.

Sprague Electric Company
335 Marshall Street
North Adams, Mass.

Tinnerman Products
8700 Brookpart Road
Cleveland, Ohio

University Sound
9500 West Reno
Oklahoma City, Oklahoma



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PART NO. 78 X 541 18M/LP/R866