TECHNICAL AND INSTALLATION DATA
MI-10002 & MI-10004 UNI-ANGULAR ELECTROSTATIC MICROPHONE AND MI-10005 MATCHING NETWORK

Ref. Dwgs.
HV 1879 (Sheet 5)
HV 1878 (Sheet 6)
211244 (Sheet 11)
211284 (Sheet 12)
HV 1881 (Sheet 7)
HV 1880

GENERAL

The MI-10002 is a microphone with a built in cathode follower type amplifier and a suspension hanger as shown on Figure 1. This unit is primarily intended for indoor use or for scenes where restricted camera angles prevail.

The MI-10004 is a combination of the MI-10002 microphone and a MI-10003 windscreen assembly like that shown on Figure 2. This unit is primarily intended for outdoor use where reduction of windnoise effects is necessary. The MI-10002 is so constructed that the MI-10003 windscreen may be quickly attached or removed without tools.

The MI-10003 windscreen is constructed of 2 symmetrical halves, one of which has a 2½" diameter white spot painted on the flat side of the perforated material. This is done so that one may know by visual inspection the internal orientation of the microphone itself (MI-10002), because when the windscreens are applied, the unit is not clearly visible through the silk inside the MI-10003. Because the windscreen halves are symmetrical, they may be applied to the mounting of the MI-10002 so that the identifying half is either in front of the "live" side of the microphone, or in back of the "dead" side of the unit. When an MI-10004 is shipped, the identifying half is located in the latter position, that is, over the "dead" side of the microphone.

Both MI-10002 and MI-10004 units are equipped with a locking type miniature Cannon receptacle mounted on the suspension hanger. A mating plug for this receptacle is supplied with each MI. A suitable boom cable must be connected between the microphone and its associated preamplifier (mixer).

The MI-10005 is a matching network (transformer) required between the microphone's cathode follower output and the associated preamplifier input. This assembly is shown in Figure 3. A receptacle at one end matches the usual boom cable complement while the receptacle at the opposite end is compatible with the usual stage microphone cables. The MI-10005 also contains A and B voltage regulating resistors with filtering elements in order to supply proper voltages to the microphone when the power is derived from sources having greater voltages. Users of the MI-10002 microphone may incorporate the equivalent elements of the MI-10005 in their existing equipment and such an arrangement is shown on Figure 4C. A mating plug for the boom cable is supplied with each MI-10005. An electrical schematic of the MI-10005 is shown on Figure 6.

LTR	DESCRIPTION	DATE	APPROVED
0	SHEET 4 REVISED.	7/1/58	
1	REPLACEMENT PARTS 500 MEG-OHM RESISTOR WAS 100 MEGOHM. SHEET 4 REVISED	2/6/58	
2	MI-10002 WAS CONNECTED FOR 12 V. OPER. .01MF CAPACITORS ADDED. MI-10005 50 OHM R1 WAS 25 OHM. ECN-VH	4/11/58	
3			

FIRST MADE FOR ____ USED ON ____

DRAWN BY ____

TRACED BY ____

CHECKED BY ____

A SIZE 210 099

SHEET / CONT'D ON SHEET 2

DRAWING. ALL EXTERNAL THREADS TO BE CLASS 2A BEFORE PLATING AND CLASS 2 AFTER PLATING; ALL INTERNAL THREADS TO BE CLASS 2B, UNLESS OTHERWISE SPECIFIED.

TECHNICAL DATA
MI-10002 & MI-10004 MICROPHONE

Output Impedance when used with RCA Stock No. 903502 transformer: 30, 150, 250 ohms.

Effective Output Level at 1000 cycles for 10 dynes/cm^2, measured at 250 ohm output terminals shown on Figure 4C: -40 dbm.

Open Circuit Output Level for normal speech at 2 ft. distance, measured at 250 ohm output terminals shown on Figure 4C: -47 VU.

Physical Characteristics:

	Without Windscreen	With Windscreen
	MI-10002	MI-10004
Length	5-5/8 inches	8-3/4 inches
Diameter	1½ inches	4½ inches
Weight	12 oz.	1 lb 4 oz.

Frequency Response: See RCA Dwg 211284.

Directional Characteristic: See RCA Dwgs 211284 and 221244.

External Connection: WK-6-32S male Cannon receptacle mounted on microphone hanger.

REPLACEMENT PARTS LIST

	Stock Number
Elastic ring	903504
Windscreen outside, front	903497
outside, back	903498
Small windscreen on microphone	903495
500 megohm resistor	903543
Knurled nuts	903496
Spring catches (3)	903500
Cannon receptacle	903499
6072 vacuum tube	903503
Cannon plug for boom cable	903517
.01 MF capacitor (2)	903547

MI-10005 MATCHING NETWORK
(See Fig. 6)

Physical Characteristics:

Length	8½ inches
Diameter	2¼ inches

REV	AP. BY	AP. DATE	1	2	3	4	5
0	Jun 5 58	M. Rittung	PAGES 4, 8 & 10 REVISED.	M. Rittung Oct 28 58		CABLE REFERENCE STOCK #903590 ADDED ON PAGES 4 & 8.	M. Rittung Oct 1/59

FIRST MADE FOR ______ USED ON ______

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A SIZE 210 099

SHEET 2 CONT'D ON SHEET 3

REPLACEMENT PARTS LIST

T_1	Transformer	Stk No. 903502
C_1	Capacitor 16/8 MF 450 V	Aerovox prs (dual)
R_1	Resistor 50 ohm 10 w adj.	Stock No. 902221
R_2	Resistor 150 K ohm 1 w 5%	Ohmite
R_3	Resistor 68 K ohm 2 w 5%	Ohmite
R_4	Resistor 39 K ohm 2 w 5%	Ohmite
J_1	Cannon WK-6-31-8 female re receptacle	Stk No. 903510
	Cannon plug for boom cable	Stk No. 903518

REPAIRS AND REPLACEMENT PARTS

It is recommended that microphones be returned to the factory for all repairs. After it has been determined definitely that trouble exists in the microphone (and not elsewhere in the circuit), obtain a "Returned Goods Tag" and proper authorization from the RCA Film Recording Sales Office serving you before returning the equipment for repairs. Attach the tag, properly and completely filled out, to the damaged unit, and forward to:

RCA Film Recording Equipment
1126 North Las Palmas Avenue
Hollywood 38, California

APPLICATION

The MI-10002 or MI-10004 microphones may be readily used with recording channels such as the RCA PM-64 or PM-64A equipments. Figure 4 B shows a conventional cable arrangement with the MI-10005 matching network located between boom cable and stage cable. Figure 5A shows a similar arrangement except a microphone preamplifier is extended closer to the microphone as is done to avoid electrical pickup in stage cables when operating the recorder on a multi-duty motor system. In this case the MI-10280 preamplifier case assembly must be modified per Figure 5B.

Should it be desirable to locate the equivalent of the MI-10005 matching network at some point other than in the microphone cable, Figure 4C shows the necessary circuit requirements. Electrical components are listed under the Replacement Parts list.

As shipped from the factory the Type 6072 tube located in the microphone proper is connected for 6.3 V heater operation. In some installations a 12.6 V supply may be more

readily available and, if so, the tube may be reconnected as shown in Figure 4C. In either case the filament current should be adjusted for 175 ma, and this current should exist at all times within ± 10% regardless of the length of cable employed between microphone and power source.

The B voltage should be 135 V, and if the MI-10005 matching network is not employed, it will be necessary to introduce a voltage divider which will lower any higher existing B voltage accordingly. A 115 volt AC operated power supply, the MI-10645, is available for this microphone. It contains besides the required A & B voltage supplies, also the matching transformers and filter network incorporated in the MI-10005.

SERVICE

To change the 6072 tube in the microphone remove the four No. 2-56 filister head screws in the lower suspension mounting ring, then carefully withdraw the lower microphone housing section and at the same time push the cable into the interior of the housing section.

When the microphone is used on location, handboom operation may be desired. In this case the cable used between microphone and the hand-held end of the handboom may be the flexible cloth covered six conductor shielded cable obtainable as RCA Stock No. 903507. If the handboom will permit installing its cable in the interior of the boom, a rubber covered type of cable like that usually employed between stage boom and mixing console may be used, such as Graybar No. 6BM-20.

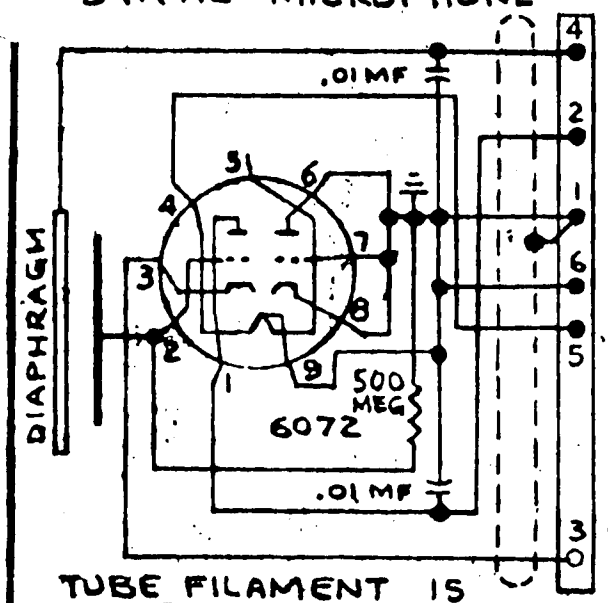
When using MI-10005 matching network between boom and associated preamplifiers or mixer, RCA Stock No. 900917 cable is recommended.

Another boom cable is known as Stock No. 903590. It is a 6-conductor shielded cable, with a plastic covering over the copper shield and a nylon jacket over the plastic covering. Its outside diameter is 5/16".

DRAWING. ALL EXTERNAL THREADS TO BE CLASS 2A BEFORE PLATING AND CLASS 2 AFTER PLATING; ALL INTERNAL THREADS TO BE CLASS 2B, UNLESS OTHERWISE SPECIFIED.

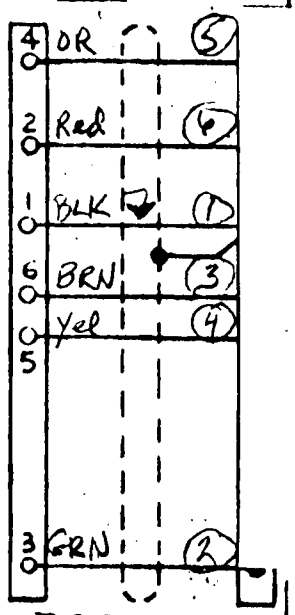
210099 SHEET 8 CONT'D ON SHEET 9

MI-10002 OR MI-10004 UNI-ANGULAR ELECTRO-STATIC MICROPHONE



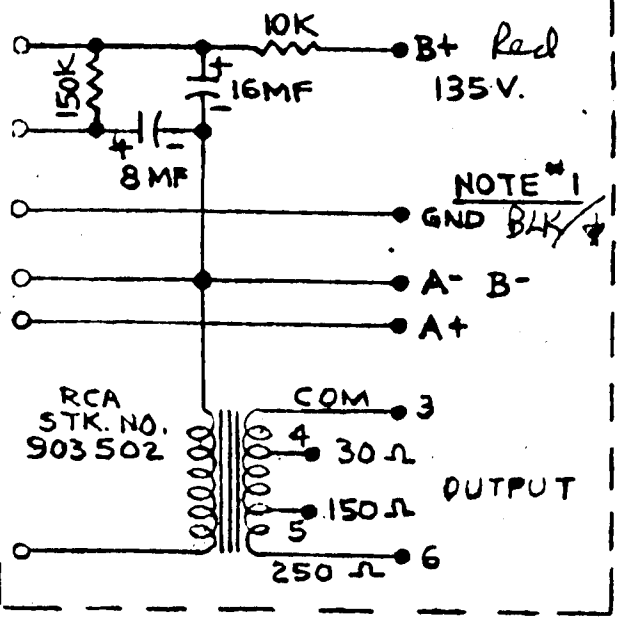
TUBE FILAMENT IS CONNECTED FOR 6.3V OPERATION. FOR 12.6V OPERATION CONNECT HEATER LEAD TO TUBE TERM 5 INSTEAD OF TUBE TERM 9.

C



BOOM OR STAGE CABLE

FILTER & IMPEDANCE MATCHING TRANSFORMER NETWORK



NOTE #1 AT POWER SUPPLY CONNECT A- TO B- & GND.

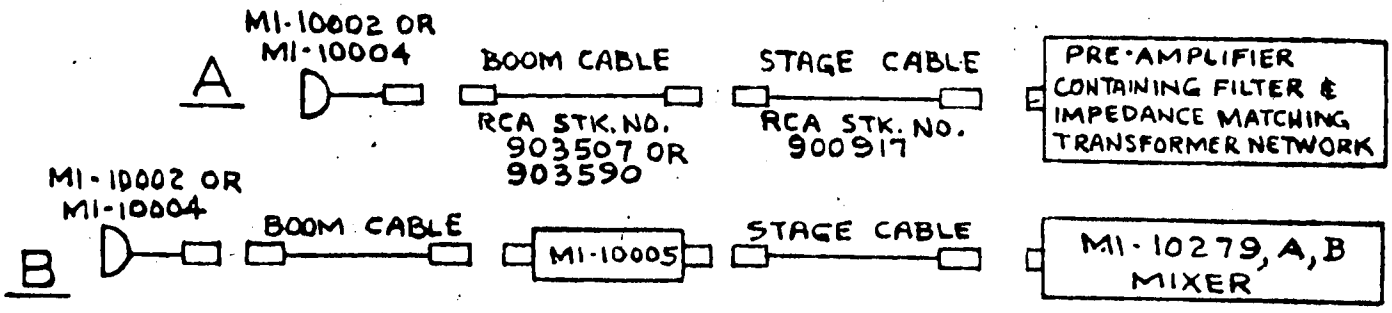


FIG. 4

0 1 2 3 4 5

FIRST MADE FOR USED ON

DRAWN BY A. Cabo Apilar, Jr

TRACED BY

CHECKED BY

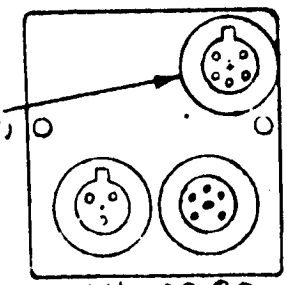
A SIZE 210099

SHEET 8 CONT'D ON SHEET 9

MI-10002 OR 11-10004 — BOOM CABLE — MI-10005 — MI-10280 MODIFIED * — STAGE CABLE — MI-10279, A, B MIXER

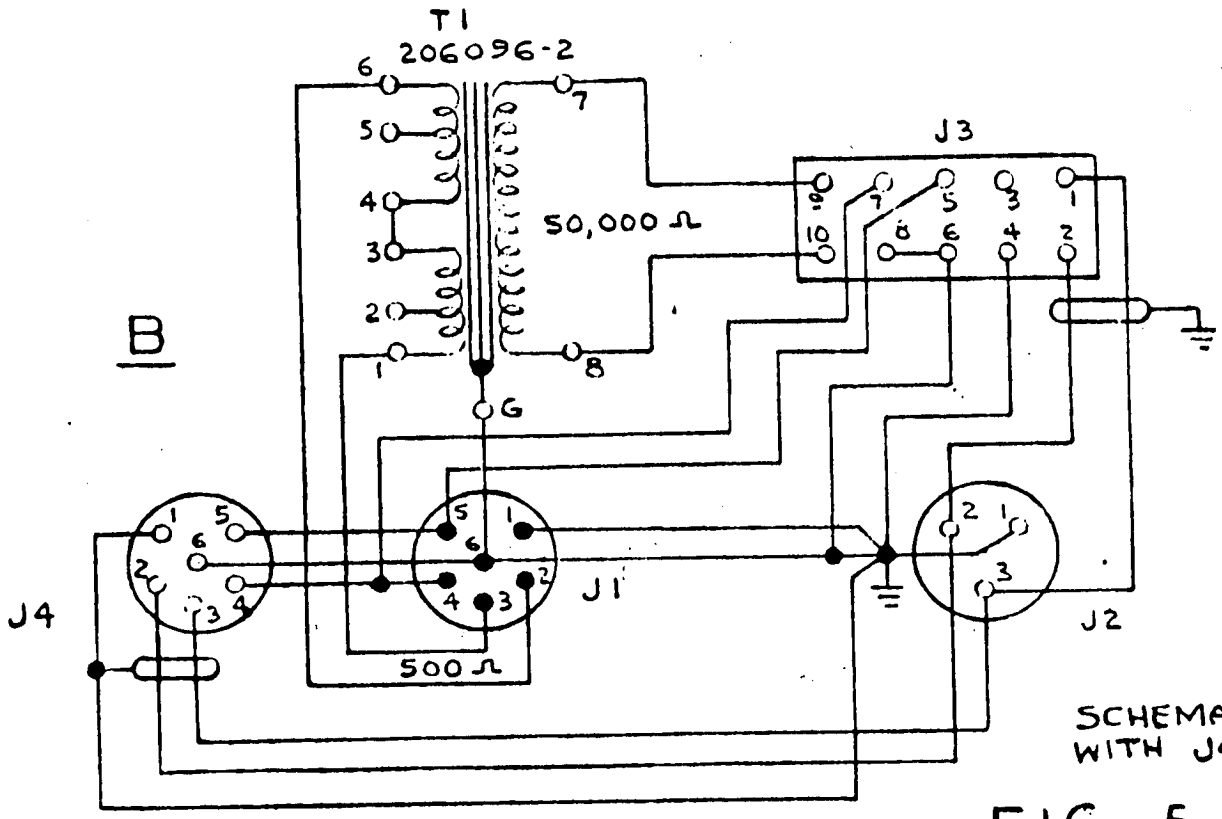
A

*MODIFICATION CONSISTS IN THE INSTALLATION OF A 6 PIN FEMALE RECEPT., (CANNON PG-13), TO ALLOW CONNECTION OF MI-10005.



MI-10280.

B



SCHEMATIC MI-10280 WITH J4 ADDED.

FIG. 5

0	1	2	3	4	5

FIRST MADE FOR — USED ON

DRAWN BY A Callen 4/29/58

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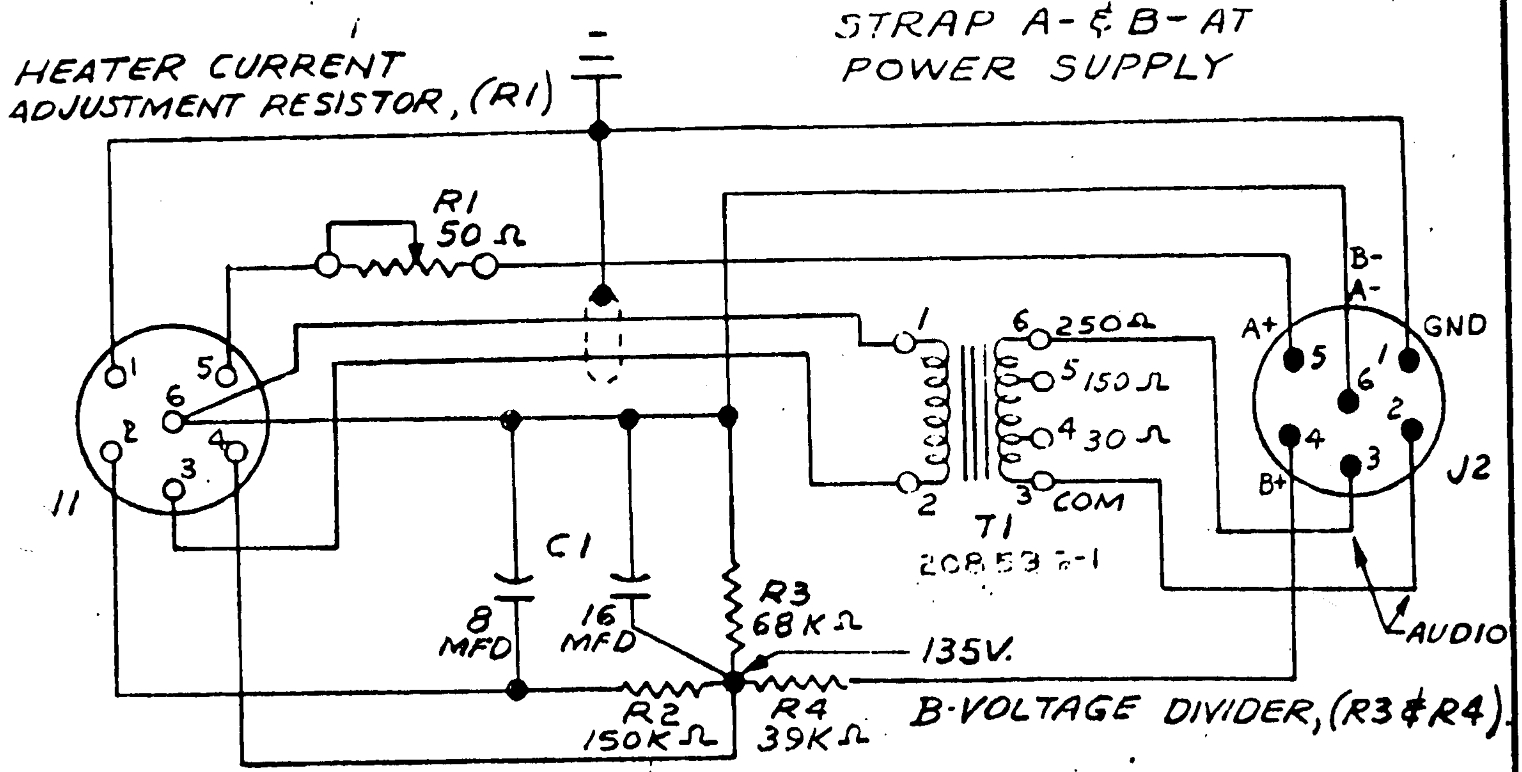
CHECKED BY

A SIZE 210 099

SHEET 9 CONT'D ON SHEET 10

DIMENSIONS ARE IN INCHES, AND INCLUDE THICKNESS OF PLATING. DO NOT SCALE DRAWING. ALL EXTERNAL THREADS TO BE CLASS 2A BEFORE PLATING AND CLASS 2 AFTER PLATING, ALL INTERNAL THREADS TO BE CLASS 2B, UNLESS OTHERWISE SPECIFIED.



MAY BE USED WITH MI-10279, A, B MIXER CONTAINING 250V. B-SUPPLY & 12.6-16V. DC HEATER SUPPLY.

MI-10005
MATCHING NETWORK

FIG. 6

0	1	2	3	4	5

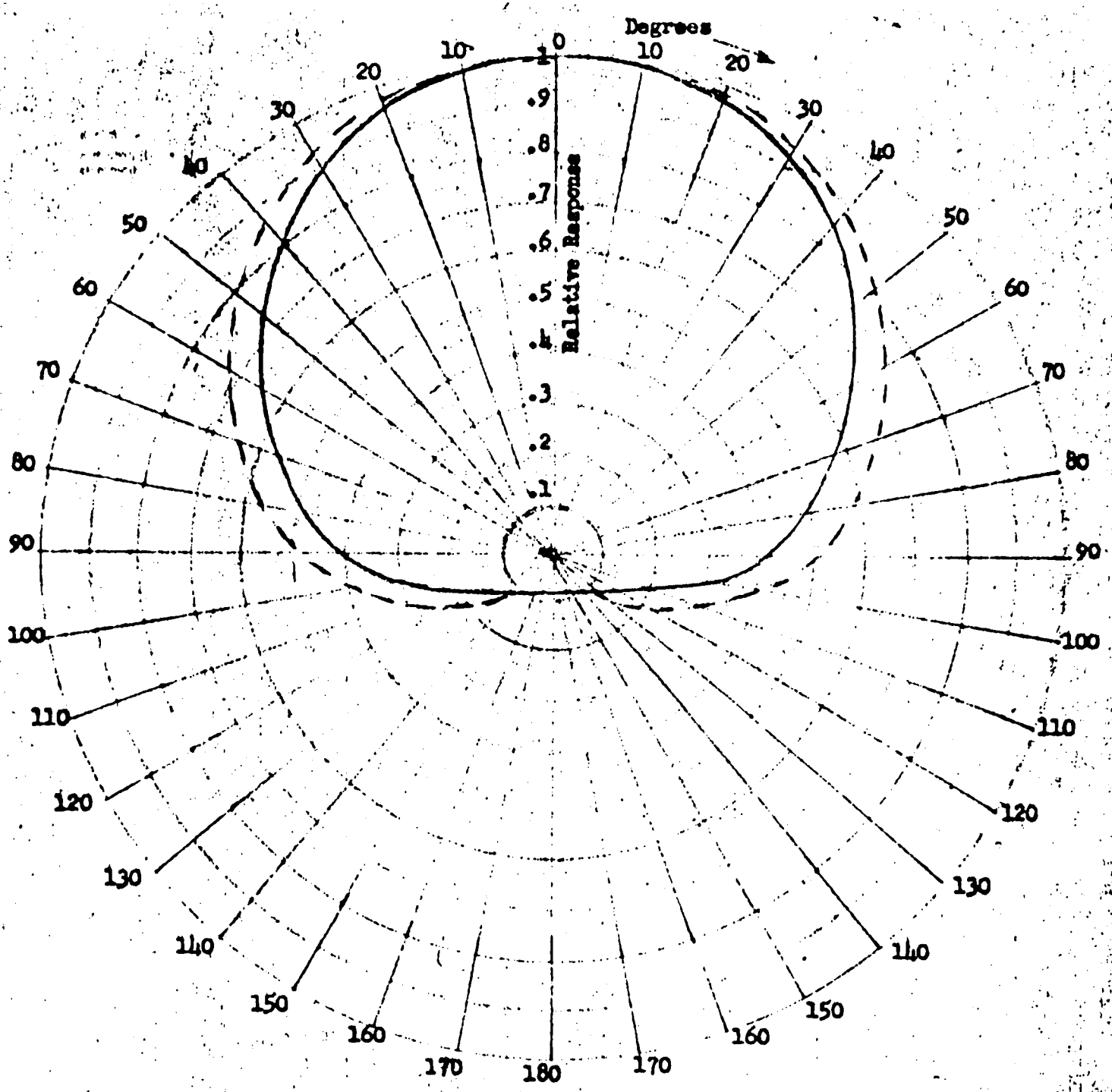
AP. BY 5/19/59
AP. MFG.

FIRST MADE FOR — USED ON

DRAWN BY April 28, '58
TRACED BY
CHECKED BY

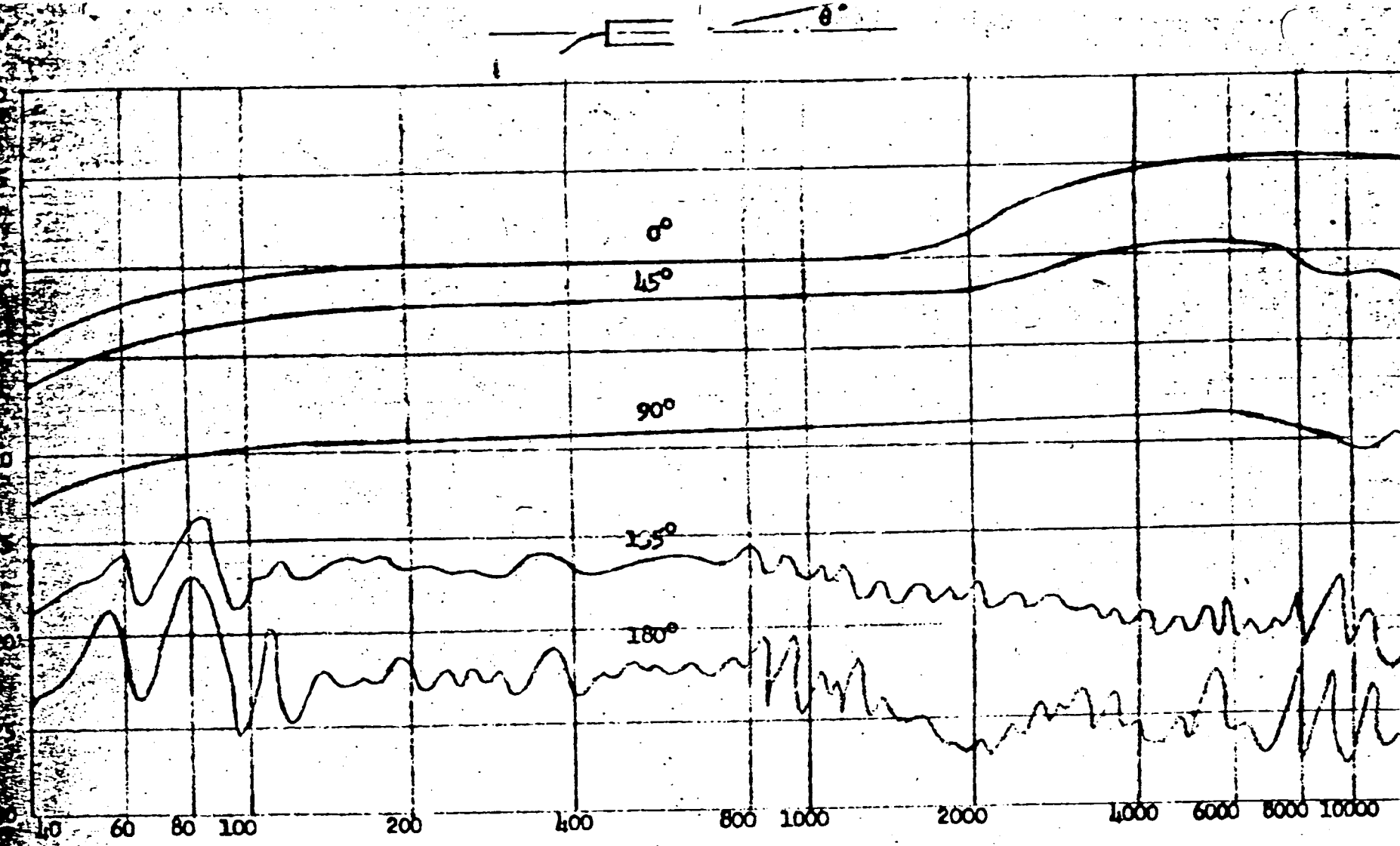
A SIZE 210 099

SHEET 10 CONT'D ON SHEET 11



—— Uni-Angular Response: $E_1 = .4 + .6 \cos \theta \cos \frac{\theta}{3}$

- - - Uni-Directional Response: $E_2 = .5 + 5 \cos \theta$



FREQUENCY IN CYCLES PER SECOND

Response frequency characteristic of the electrostatic uniangular microphone for sound incident at angles of 0°; 45°, 90°, 135° and 180°. 0° corresponds to the cylindrical axis of the microphone.

TR

211284