

DATE 6-29-61

H. 1 OF 19

COMPILED BY

H.O.

TMC

SPECIFICATION NO. S-566

D

TITLE:

STAMPING AND ENGRAVING

JOB

APPROVED

R.W. S.T.M.

STAMPING AND ENGRAVING

OF

CHASSIS, TERMINAL BOARDS, FRONT PANELS, ETC.

PURPOSE: THIS SPECIFICATION SHALL ESTABLISH THE FORMAT FOR USE  
IN PREPARING STAMPING AND ENGRAVING DRAWINGS.

REFERENCES

MIL-E-16400 (Latest Revision)

MIL-E-19100

MIL-STD-12 (Latest Revision)

MIL-STD-16 (Latest Revision)

FRENCH AND VIERCK (Drawing Manual)

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4. Illustrations for Front Panel Engraving
  - a. Drawing Requirements
  - b.
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1. INSTRUCTION PLATES:

When specified in the individual equipment specification, instruction plates showing wiring and schematic diagrams, calibration charts, operating instructions, safety notices, lists of tools, lists of contents, and similar information shall meet the following:

1.1 LETTERING:

Gothic type lettering shall be used.

1.2 BORDER:

A border of  $\frac{1}{4}$  inch or more shall be provided on each edge of the instruction plate.

1.3 LEGIBILITY:

Instruction plates shall be legible and shall be designed to remain so for the service life of the equipment on which they are mounted.

1.4 MATERIALS AND PROCESSES:

One of the following materials and processes shall be used for instruction plates:

- (a) Reverse etched, lithographed, printed, or silk screened marked on aluminum, nickel-copper-alloy, or corrosion-resistant steel plate.
- (b) Printed on a good grade of white book paper and laminated between two sheets of clear transparent plastic, vinyl chloride or suitable copolymers thereof, or polyethylene terephthalate with light-fast copolymer or polyethylene adhesive systems, bounded together to seal against moisture.

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(c) Laminated thermosetting plastic conforming to Specification MIL-P-78.

(d) Etched on aluminum, nickel-copper-alloy, or corrosion-resistant steel plate and filled with permanent contrasting color.

## 1.5 RUBBER STAMPING AND DECALCOMANIAS:

Rubber stamping and decalcomanias shall not be used, unless specifically authorized by the bureau or agency concerned, in which case the marking shall be covered with a coat of clear lacquer.

## 1.6 INSTRUCTION PLATE MOUNTING:

Instruction plates (except rubber stamping and decalcomanias) shall be securely and permanently mounted using screws. The watertight integrity of the equipment shall not be impaired.

## 2. PARTS IDENTIFICATION BY REFERENCE DESIGNATIONS (SYMBOL DESIGNATIONS).

In order to facilitate maintenance, each part assembled in a major unit and set shall be identified by an appropriate reference designation in accordance with MIL-STD-16.

### 2.1 LOCATION OF REFERENCE DESIGNATIONS:

The reference designations shall be located adjacent to each part and shall be marked on the chassis, back of the front panel, partitions or insulator strips. Reference designations shall not be marked on parts which are subject to replacement. The reference designations shall be marked in such a position as

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to physically locate the parts and yet be readily visible for purposes of maintenance with removal of other parts. The primary intent of this requirement is that removal of a part shall not result in loss of the identification of the physical location of that part.

## 2.2 ENCLOSED PARTS:

Reference designations for parts enclosed in separate and removable shields or compartments may be marked on the shields or supporting structures for such parts, provided that the replacements of such parts does not require destruction of the original shields or supporting structures and provided that such shields or supporting structures are not interchangeable with other shields or supporting structures within the major unit. Reference designations shall not appear on electron tube shields.

## 2.3 ELECTRON TUBE AND SOCKET IDENTIFICATIONS:

The type designation of each tube and the appropriate reference designation shall be marked adjacent to the tube socket on the tube side of the chassis or supporting structure for identification of the particular tube. The reference designation used to identify the tube socket and the type designation of the tube shall be marked on the reverse side of the chassis adjacent to the socket. If available space does not permit such marking of the tube type designations and reference designations for tubes and tube sockets, a diagram showing the location of the tubes and sockets shall be

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placed where it is visible when viewing either the tubes or the bottom of the tube sockets.

## 2.4 METHOD OF MARKING:

Identification marking shall be permanent and legible. The markings on plastic or metallic materials shall be effected by stamping, engraving, stenciling with smudge-proof ink covered with a coat of clear lacquer, or silk screening: PAPER LABELS OR DECALCOMANIAS SHALL NOT BE USED.

## 2.5 FUNCTION IDENTIFICATION:

The function of each control, indicator, connector, and test point, shall be identified by symbols and abbreviations. The identification shall be adjacent to the control, indicator, connector and test point. All terminals for connection to transmission lines shall be marked with the nominal characteristic impedance of the line.

3.

### GENERAL RULES

A number of recommendations for correct chassis marking and component identification are summarized in the chart below:

#### TWELVE RULES FOR ELECTRONIC- CHASSIS MARKING

1. Locate markings adjacent to referenced component.
2. Make markings legible.
3. Decide how permanent, markings should be.
4. Be sure markings are visible without moving any components.

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5. Locate markings in relation to each component in a consistent manner.
6. Use correct designation letters.
7. Orient markings so they can be read when chassis is installed in console.
8. Be sure adequate information is provided on adjustable-control markings.
9. Mark stacked components so they can be individually recognized.
10. Clearly identify individual sections of dual electrical or electronic components.
11. Make sure markings will not be lost if components are removed.
12. Identify tubes or other components which are enclosed on the outside of the enclosure.

Marking location may be limited by the marking process selected. Therefore, one of the first considerations in marking electronic equipment should be the method of marking. Several processes are listed below: Therefore, one of the first considerations in

13. All lettering shall be in ink and location dimensions shall be clear and sharp. The LeRoy lettering guide is to be used where practicable. Size of characters, style, color and approximate location are to be specified (see example).

## MARKING METHODS

<u>METHOD</u>	<u>CHARACTERISTICS</u>
1. Rubber Stamp	<ol style="list-style-type: none"><li>a. Slow process.</li><li>b. Suited only for very small quantity.</li><li>c. Quality varies with application skill</li><li>d. Changes are easily made.</li></ol>
2. Engraving	<ol style="list-style-type: none"><li>a. High in cost.</li><li>b. Suited only for small quantities.</li><li>c. Changes cannot be made easily.</li><li>d. Permanent.</li></ol>
3. Silk screen	<ol style="list-style-type: none"><li>a. Professional appearance.</li><li>b. Suited for high quantity.</li></ol>

NOTE:

SEE TMC SPEC. S-727

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4. Simulated silk screen		a. Professional appearance. b. Suited for small to medium quantity, 5 to 500 pieces	
5. Decalcomania		a. Professional appearance. b. Slow process not suited for production. c. Not applicable to military equipment.	
<p>NOTES TO BE INCORPORATED ON LETTERING DRAWINGS.</p> <p>Size of characters, style, color and approximate location are to be specified</p> <p>Typical Example: _____</p> <p>Marking Process: As per TMC Specification S-727</p> <p>Lettering: 1/8 High Black, Gothic Located as Shown</p>			

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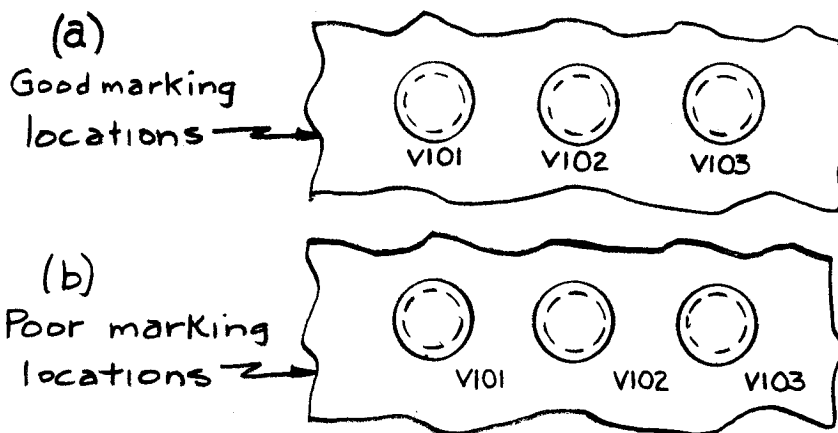
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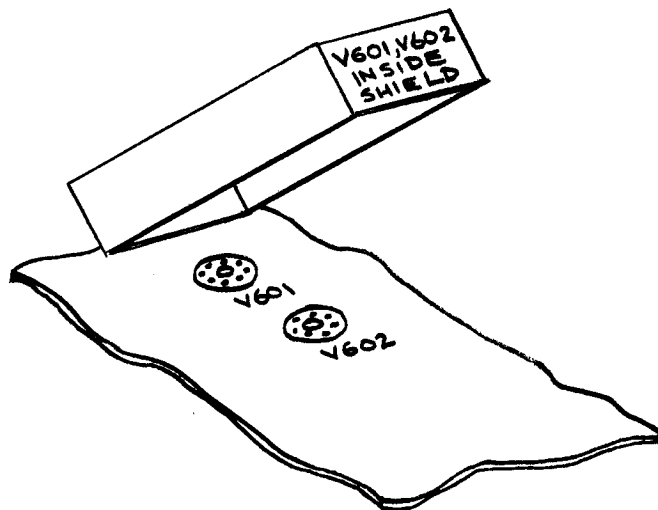
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The following details shown are typical examples of chassis marking and component identification.

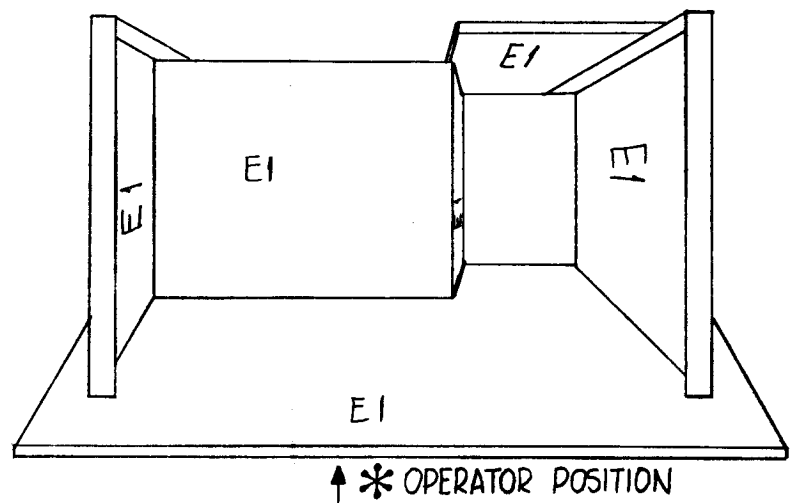
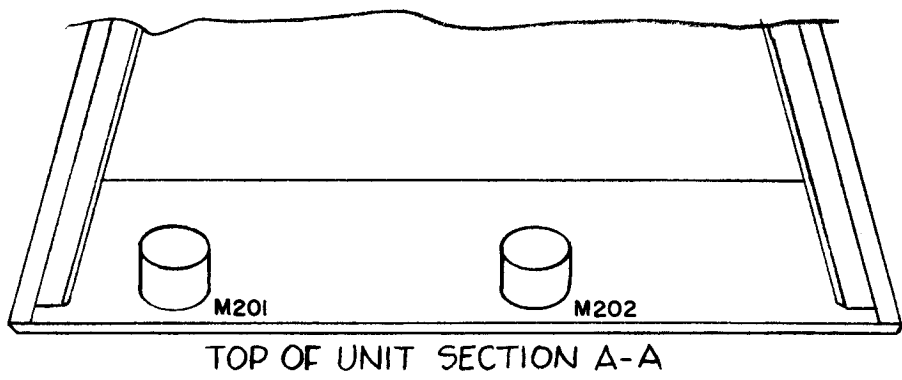


Identify markings specifically with each chassis component, (a) Don't mark half way between two components, (b) because positive identification is often impossible.

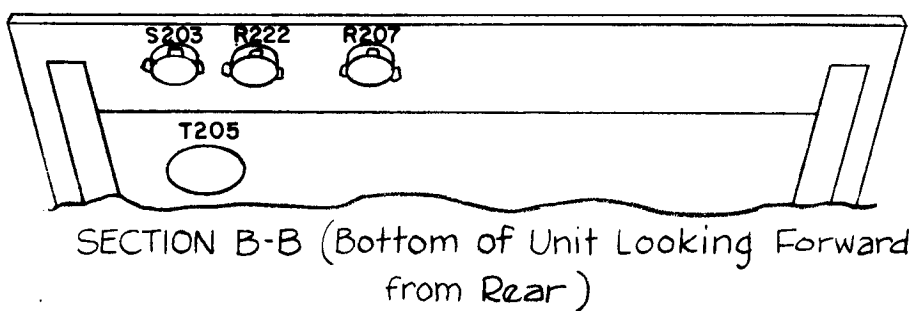
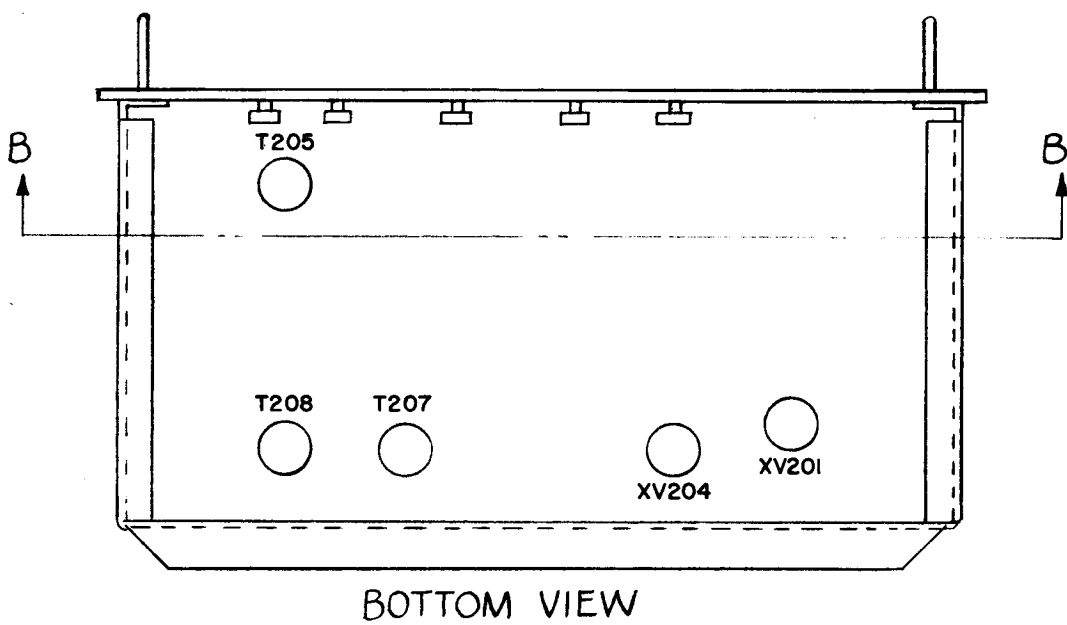
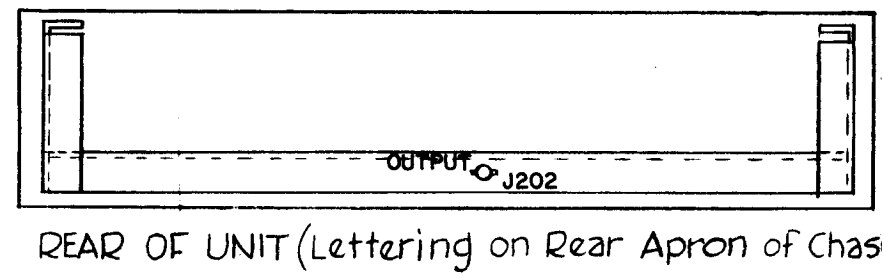
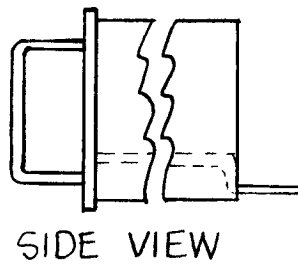
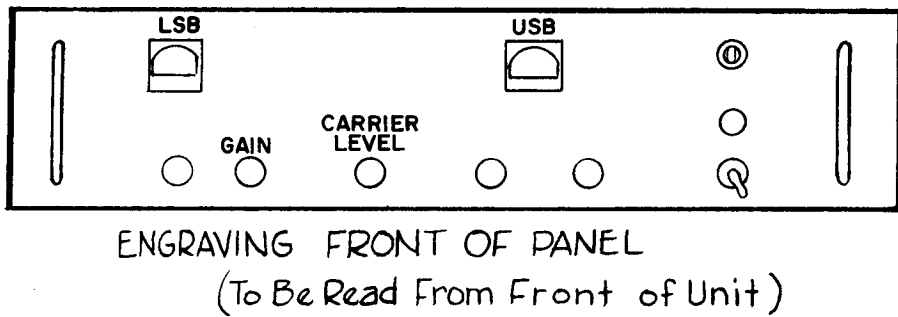
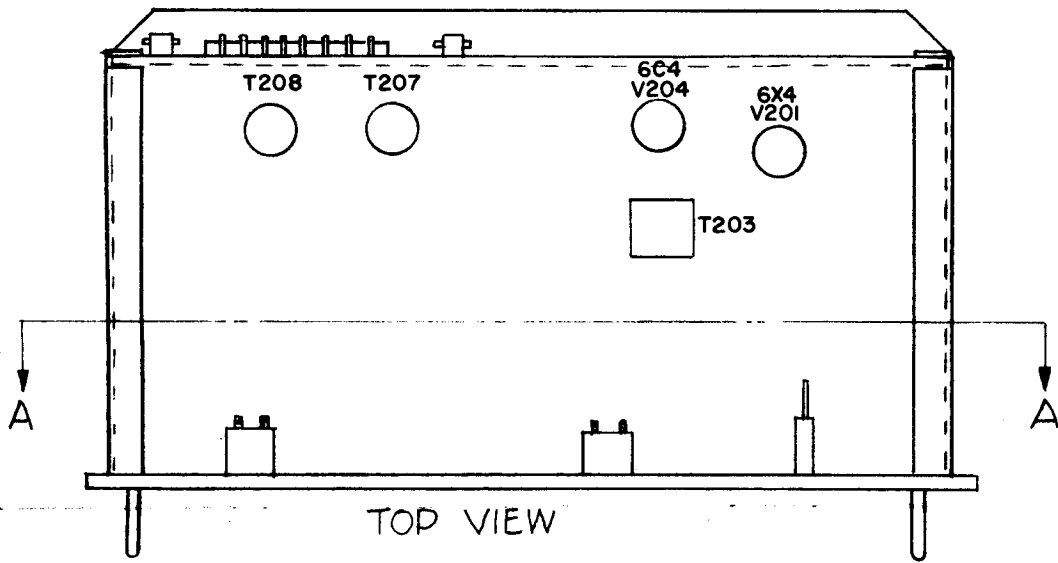


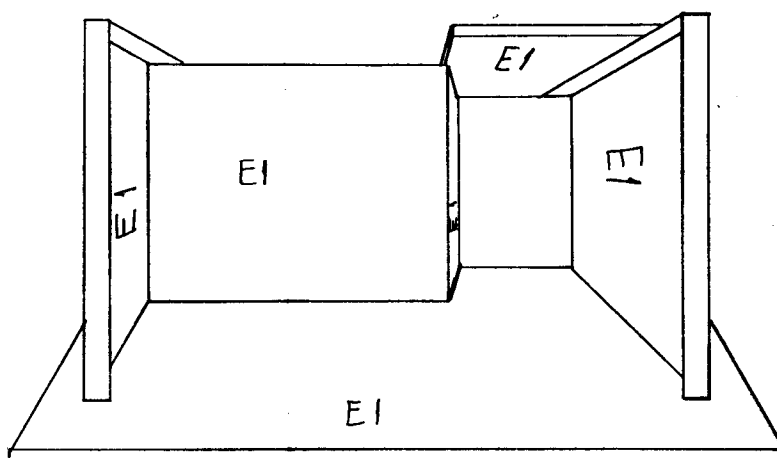
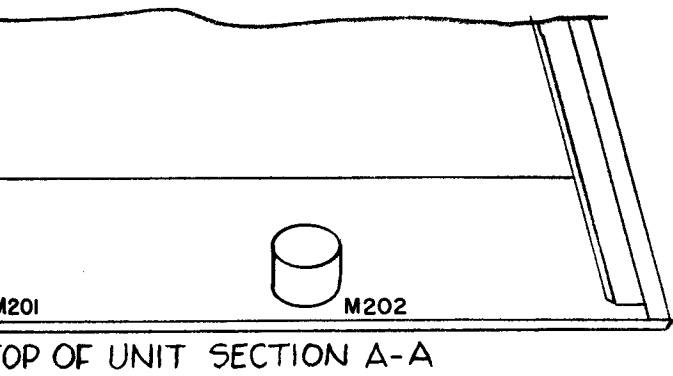
Label enclosed components on both the inside and outside of the shield.





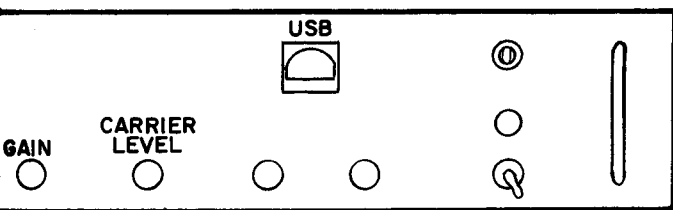
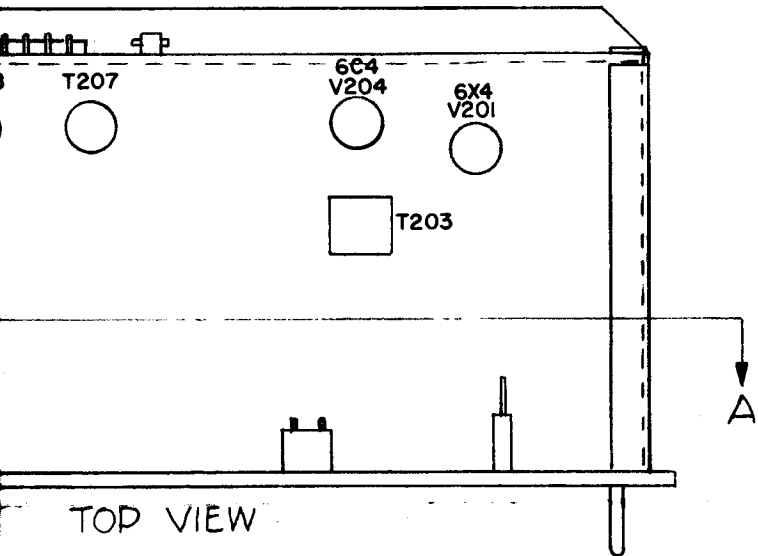
Chassis Stamp will be read from the operator's Position, as if the unit were mounted in a Console or other Type of Cabinet.



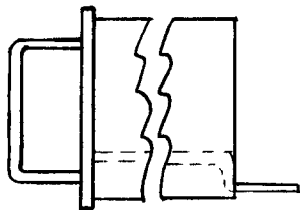


↑ \* OPERATOR POSITION

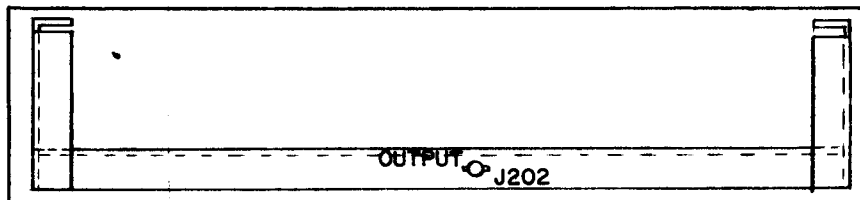
Chassis Stamp will be read from the operator's Position, as if the unit were mounted in a Console or other Type of Cabinet.



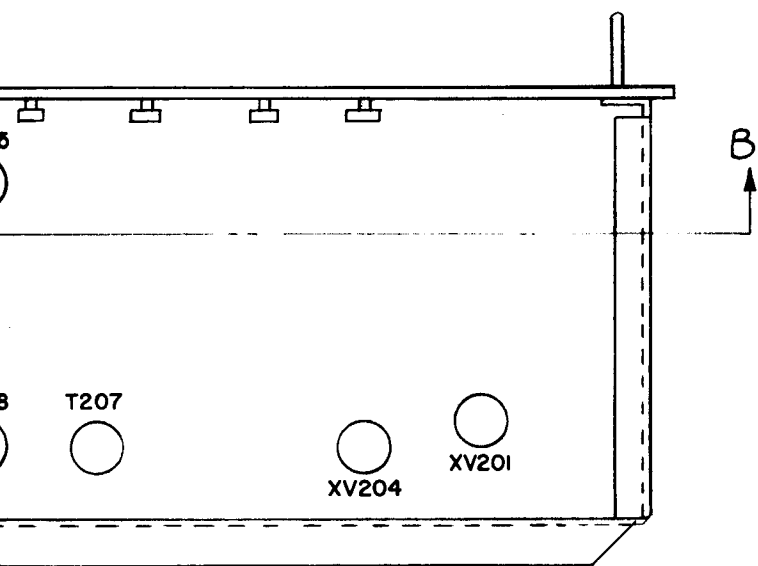
FRONT VIEW OF PANEL  
(To Be Read From Front of Unit)



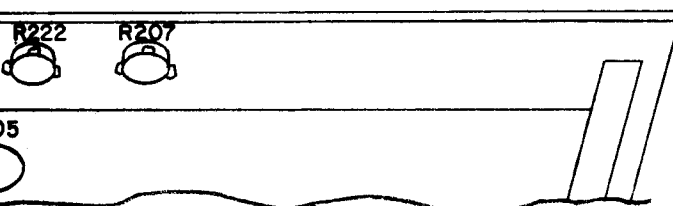
SIDE VIEW



REAR OF UNIT (Lettering on Rear Apron of Chassis)



BOTTOM VIEW



B-B (Bottom of Unit Looking Forward from Rear)

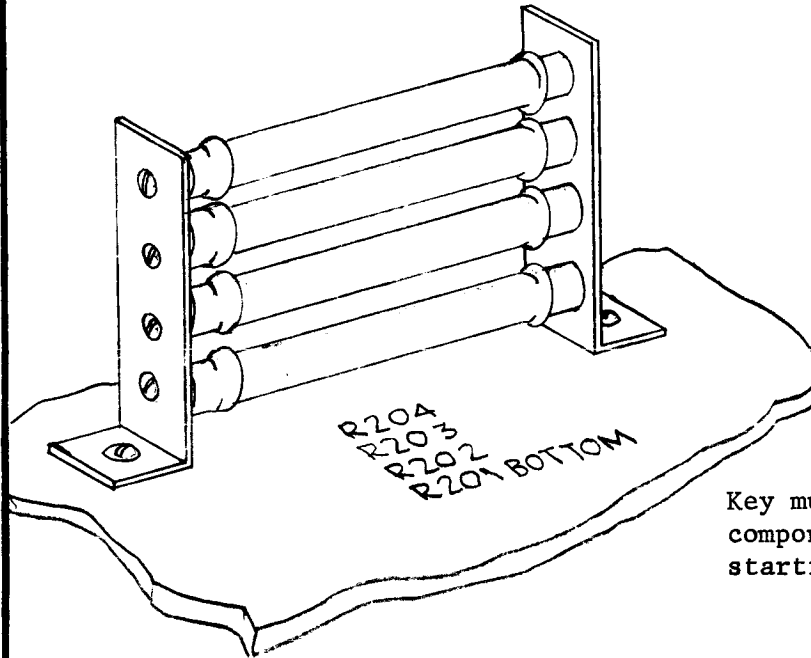
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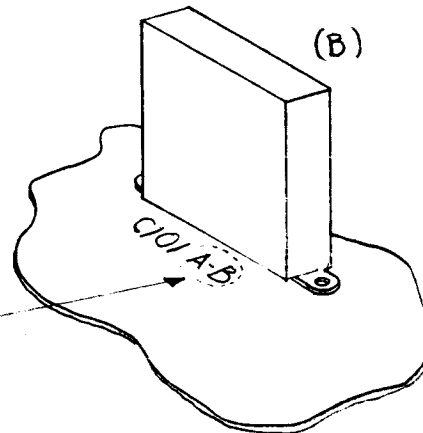
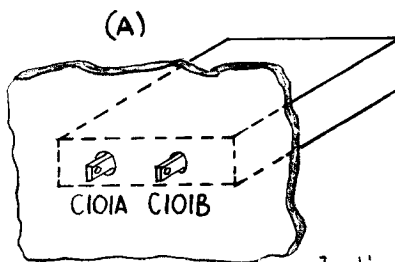
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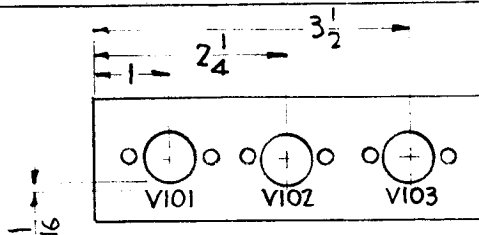


Key multiple markings for stacked components with an order of stacking starting point, such as top or bottom.

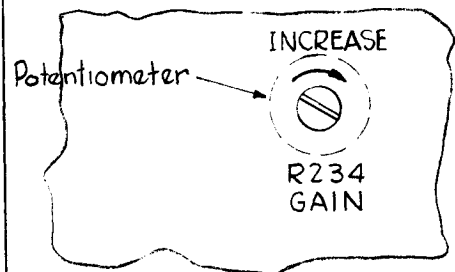


Indicates Dual capacitor

Mark sections of dual components on both the bottom a, and top, b, of chassis.



Show exact locations of markings with a dimensioned drawing of the chassis.



Mark increase or decrease indications clearly on adjustable controls.

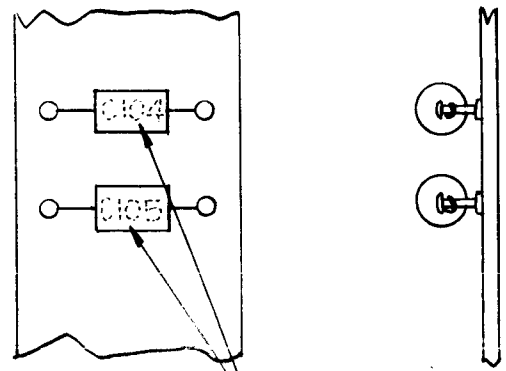
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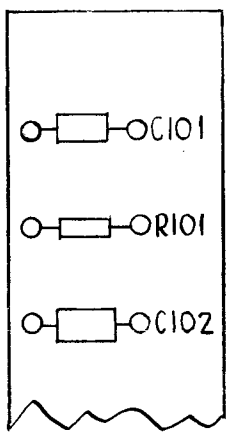
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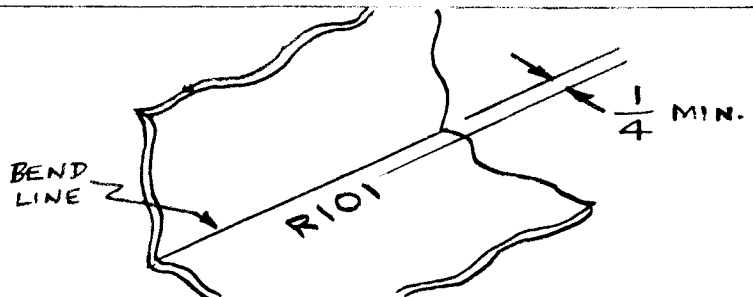


Hidden markings

Don't hide markings under electrical or electronic components. Wiring on chassis may make numbers difficult to read.



Position markings consistently. Leave no room for human judgement in determining component and part number association.



A minimum of 1/4 spacing is required for lettering on interior walls of chassis, brackets, etc.

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The Height, Depth and Width of Stroke on all lettering must be specified. Use chart below for typical dimensions.

HEIGHT OF LETTERS	DEPTH OF STROKE	WIDTH OF STROKE
1/16	.010	.010
3/32	.010	.015
1/8	.010	.020
5/32	.010	.020
3/16	.010	.025
Dots	.010	1/16 Dia.
Lines	.010	.015
Arrowheads and Tails	.010	

These notes are to be used where they apply. (unless otherwise specified).

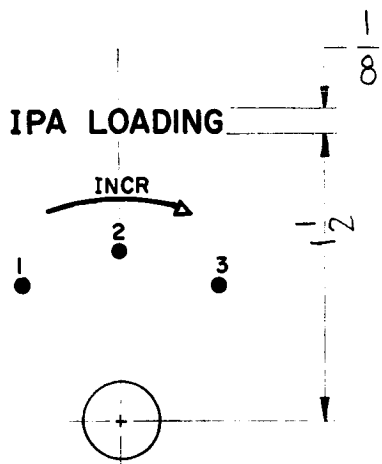
1. All dots to be white filled.
2. All lettering to be white filled.
3. All lines to be white filled.
4. All arrowheads and tails to be white outline fill.
5. All letter groups to be centered on holes. (or slots)
6. Engraving to be Gothic white filled size shown on chart.

One drawing number shall be used for the front and rear views of the front panel. it would be preferable to have both views on one sheet of paper. Where this is impracticable, then two (2) sheets are to be used and they shall be marked (sheet 1 of 2) and (sheet 2 of 2). Sheet one (1) will be the front ENGRAVING  
Sheet two (2) will be the rear STAMPING.

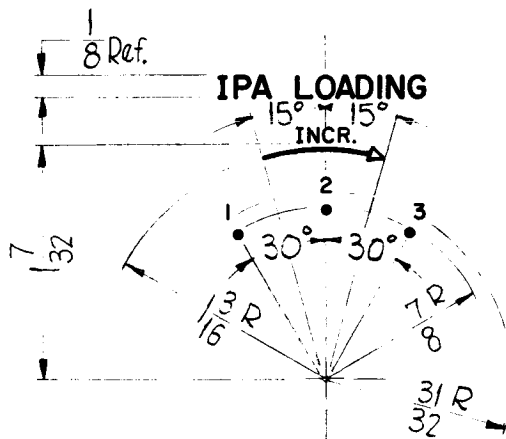
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TYPICAL DETAILS AND NOTES FOR DIAL CAL.

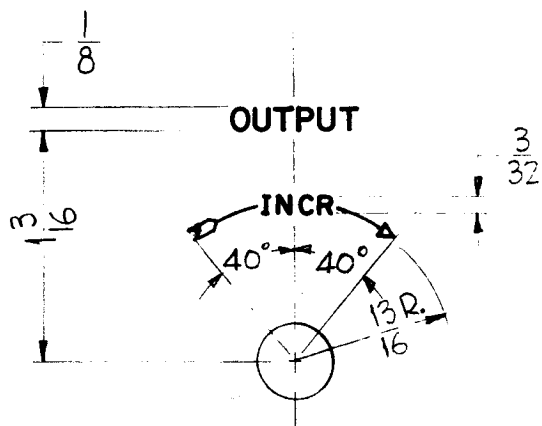
Refer to the following details for typical layouts of letter groups and symbols in relationship to knobs, switches and other electronic components.



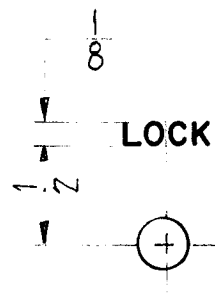
FRONT PANEL ENGRAVING  
 USING MP-108



LAYOUT OF ENGRAVING FOR IPA LOADING SW.  
 ALL LETTERING 3/32" HIGH. (Unless otherwise specified)



DETAIL USING MP-100-4



DETAIL USING MP-102-2

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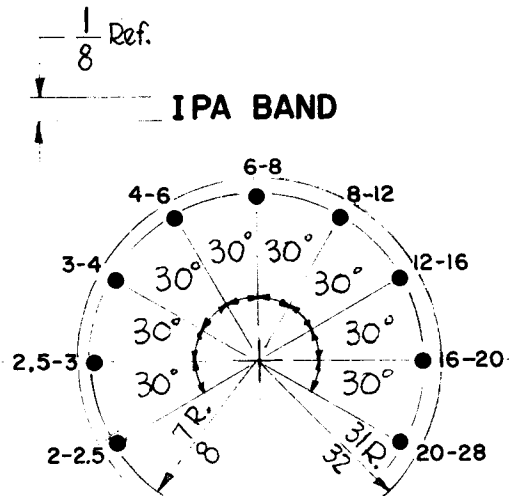
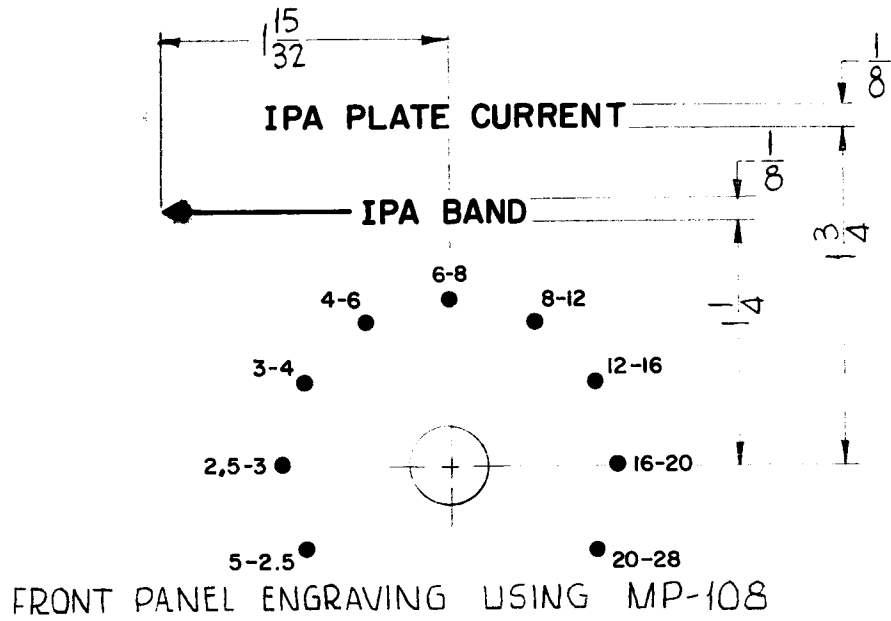
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TYPICAL DETAILS AND NOTES FOR DIAL CAL.



LAYOUT OF ENGRAVING FOR "IPA BAND" AS SHOWN ABOVE  
 ALL LETTERING 3/32 HIGH. (UNLESS OTHERWISE SPECIFIED)

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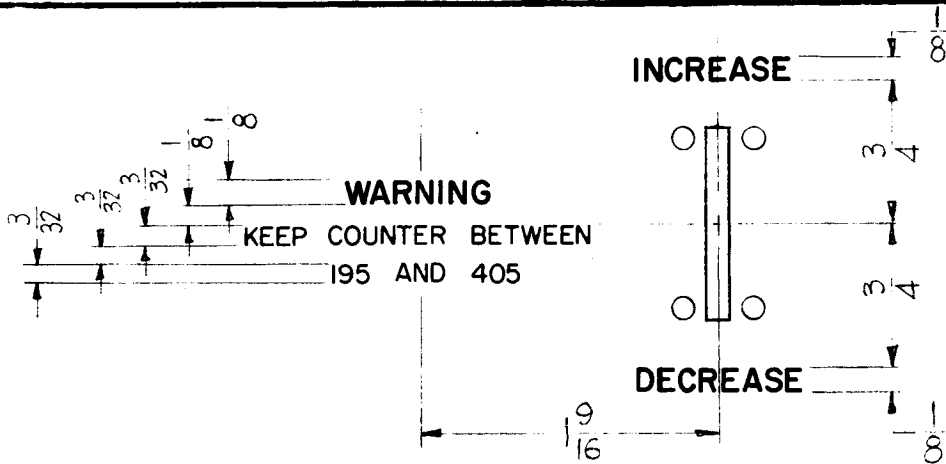
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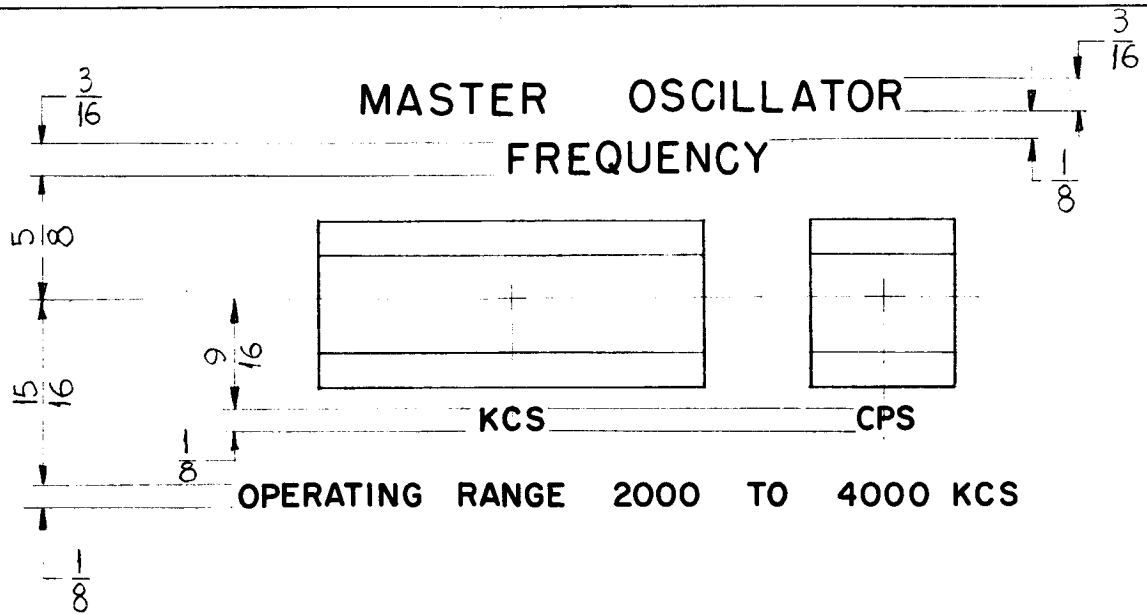
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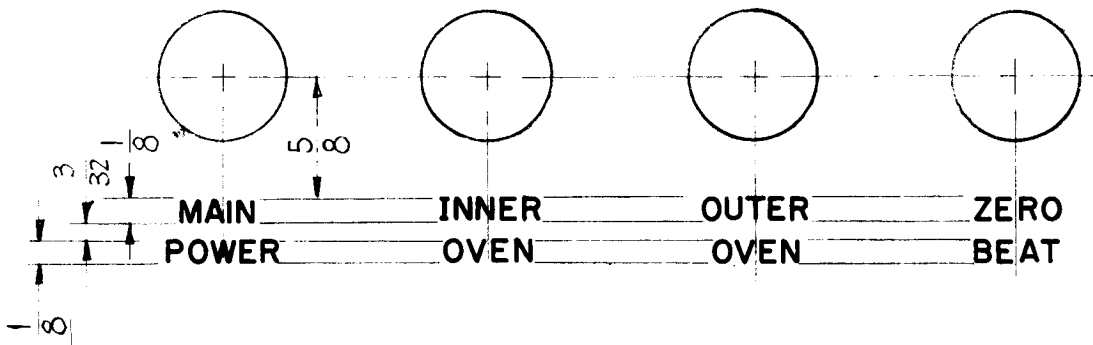
TYPICAL DETAILS AND NOTES FOR DIAL CAL.



LAYOUT OF COUNTER CONTROL FOR MODEL VOX



ENGRAVING DETAIL FOR "COUNTER" ON MODEL VOX



ENGRAVING DETAIL FOR INDICATING LIGHTS



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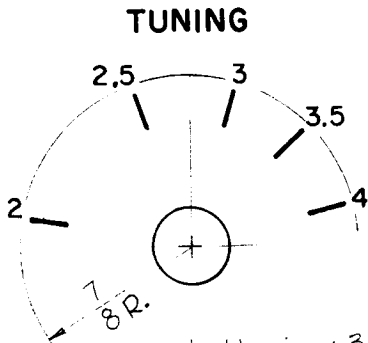
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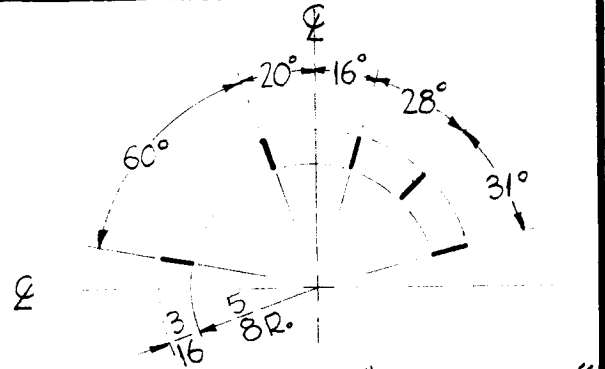
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TYPICAL DETAILS AND NOTES FOR DIAL CAL.

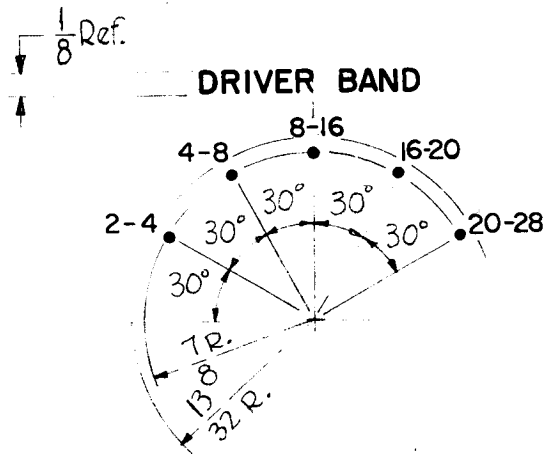
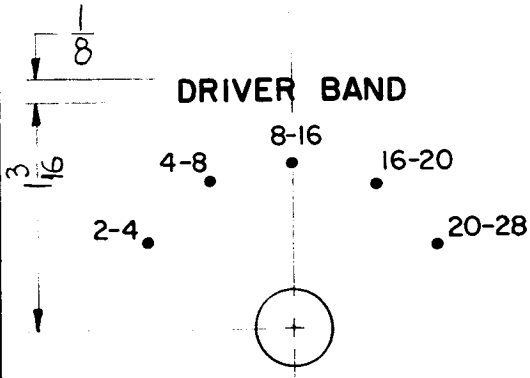
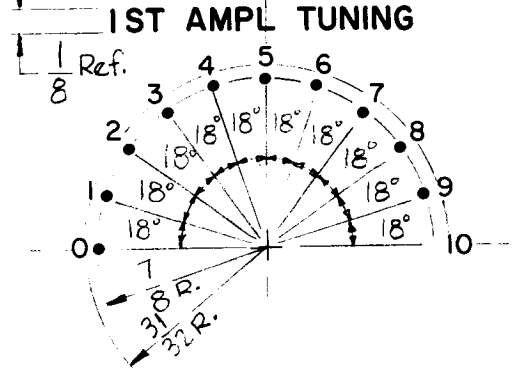
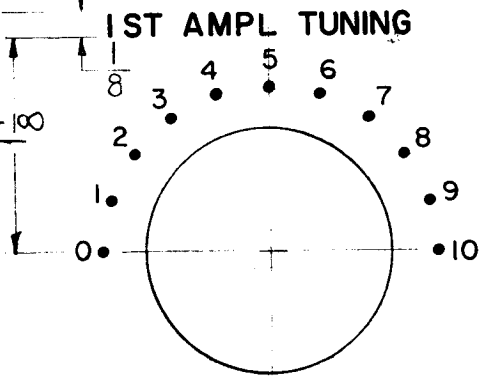
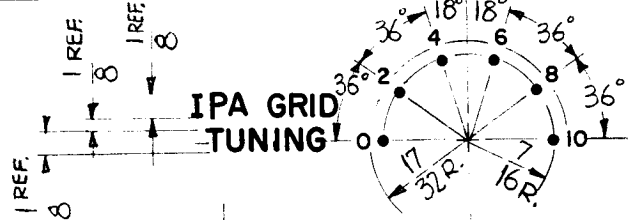
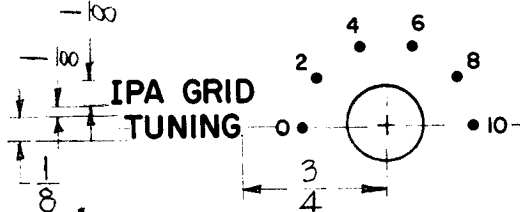


Lettering  $\frac{3}{32}$  High



Angle Displacement "Tuning Detail"

ENGRAVING USING MP-108



(All Lettering  $\frac{3}{32}$  High, Unless otherwise Specified.)

TYPICAL LAYOUTS USING MP-108

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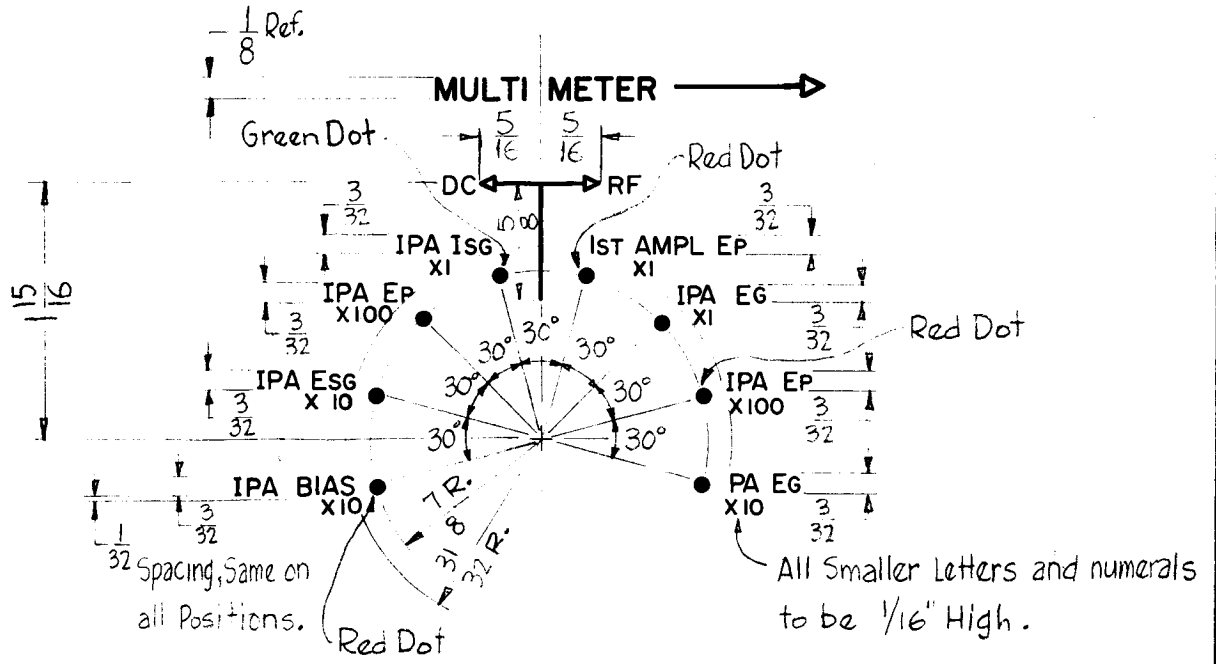
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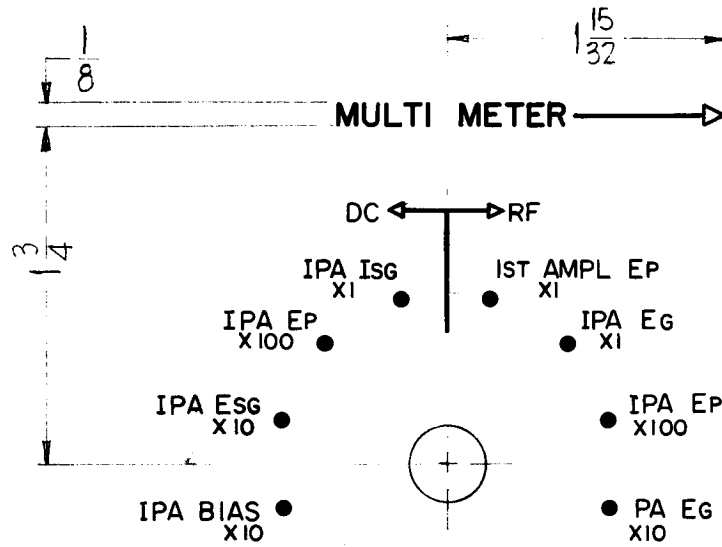
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TYPICAL DETAILS AND NOTES FOR DIAL CAL.



All Dots 1/16 Dia. ~ Colors (3) Red filled, (1) Green filled; Remaining (4) Black filled (As Shown).



TYPICAL LAYOUT USING MP-108

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DIAL CALIBRATIONS

## DIAL CALIBRATIONS

All dials will be enlarged 3 or more times normal scales. They will be drawn in ink and all art work must be accurate. Following are a few typical examples of notes put on this type of drawing:

### SPECIAL NOTES:

Drawing scale 3 times normal size (  $6 \frac{1}{4}$ " D ).

Reduction must be done accurately and without distortion.

Dial Calibration circles must be concentric to dial blank center, outermost circle must be kept within .005".

Dial blank to made from TMC Drawing PX-252.

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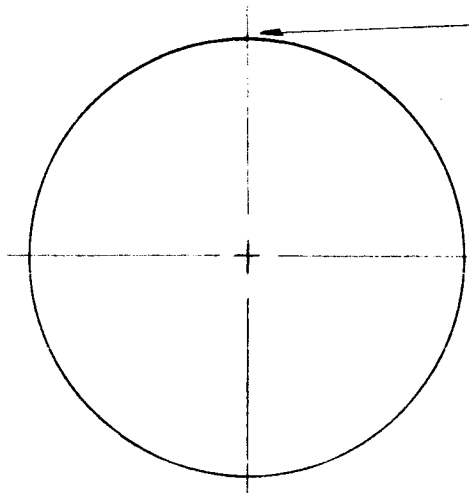
# TMC SPECIFICATION NO. S-566

TITLE: STAMPING AND ENGRAVING

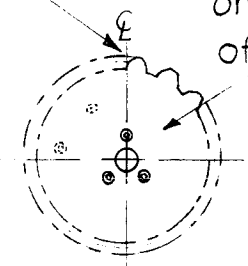
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APPROVED

## TYPICAL DETAILS AND NOTES FOR DIAL CAL.



This Line To Align with  
Ref. Line on TMC Dwg. #GR-161.



NOTE~Print  
on this side  
of GR-161.

GR-161 DETAIL

DRAWING SCALE 3 TIMES NORMAL SIZE (5-7/8 DIA.) REDUCTION MUST BE DONE ACCURATELY AND W/O DISTORTION.

DIAL CALIBRATION CIRCLES MUST BE CONCENTRIC TO DIAL BLANK CENTER. OUTER MOST CIRCLE MUST BE KEPT WITHIN .005.

BLACK LETTERING ON WHITE, LUSTERLESS BACKGROUND.

NOTE - INFORMATION TAKEN FROM TMC DWG LD-217.

### NOTES FOR DRAFTING DEPT. ONLY

LETTERING: LEROY TEMP. #240 - PEN # 3

LINE WORK: PEN # 4

REF : GR-161 & LD-874-B (ESCUTCHEON)