

**SECRET**

Engineering Div.

ENG-7-464

Chief, Supplemental Programs Division, OC

24 April 1957

ATTN :

Chief, Engineering Division, OC

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Oscillators - IN-3X and IN-1X

25111

1. Forwarded herewith are prototypes of the IN-3X, fixed frequency reference oscillator, and the IN-1X, variable frequency audio oscillator. The IN-3X represents the final prototype for evaluation prior to fabrication of the complete order. The IN-1X is an electrical prototype only since certain agreed upon changes in packaging will be made when the unit is returned.

2. Although the circuit study of the IN-1X has been completed, further production of this oscillator will depend on the quality of the unijunction transistors now on order. The stand-off ratios and base resistance characteristics of these transistors have been specified, in accordance with our study, to insure an accuracy of  $\pm 2\%$  over the specified temperature range. Reliability checks will be run on these transistors when received.

3. In regard to the IN-1X, a new layout will be made in accordance with our agreement. It is for this reason that the present unit is considered an electrical prototype only. The relocation of some controls and battery storage will facilitate a simplified hook-up and neater appearance. A certain minimum space must be allowed for the frequency determining capacitors as these will vary according to the particular unijunction transistor used.

4. Schematics, parts lists, and a calibration curve are included. A few control markings have been made in order to avoid ambiguity. Please specify all additional marking required.



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Attachments:

- Schematics (2)
- Parts Lists (2)
- Calibration Curve (1)

R&D Lab/AJS/rkb (24 April 1957)

DOC	10	REV DATE	4-12-80	008632
ORIG COMP				
ORIG CLASS	5		6	C
JUST	22	GENY	2010	

Distribution:

- Original and 1 - Addressee
- 1 - R&D Lab
- 1 - OC-E Reading
- 1 - OC-E Chrono
- 1 - R&D Chrono
- 1 - Dev's

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**FIXED FREQUENCY REFERENCE OSCILLATOR**

**IN-3**

*CC-1*

### I. GENERAL DESCRIPTION

The IN-3 <sup>oscillator</sup> provides a highly stable 1000 cycle <sup>reference</sup> tone for <sup>recorder speed correlation.</sup> reference purposes. It is completely transistorized, ~~and~~.

A high precision tuning fork is used as the frequency determining element. The IN-3 is battery operated by either a <sup>cell or</sup> dry or mercury cell. An additional plug has been provided which ~~makes possible "remote control operation of the unit.~~ <sup>function of the "out line"</sup> ~~to permit operation from a remote point.~~

II —————

## II. ELECTRICAL CHARACTERISTICS

1. Power Source: Z cell (Burgess) <sup>or</sup> ~~Mercury~~ Mercury cell RM-5012R
2. Battery Polarity: ~~Reversing~~ reversing; See paragraph 4.2
3. Output Impedance: 2000 ohms approximately
4. Stability: 1 part in 10,000 over temperature range *specified.*
5. Output Millivolts: 2K - 35 mv (earphone)  
5K to 100K - 100 mv (recorder)
6. Temperature range:  $-40^{\circ}$  to  $+40^{\circ}$  C
7. Warm-up Time: 45 seconds
8. Local Control: Power - SW1 (on-off)  
Output Control - SW2 (push button)
9. Remote Control: Remote position not furnished  
Power switch (on-off)  
Output switch (push)  
Remote battery

### III. PHYSICAL CHARACTERISTICS

Dimensions:	Length	Width	Height	
	3-15/16"	2-1/4"	1-1/32"	Case
	4-5/16"	2-1/4"	1-1/32"	Over-all

Weight: 14 ounces including battery.

### IV. OPERATING INSTRUCTIONS

- 4.1. *The controls of the IN-3 are arranged so that*  
~~The IN-3 may readily be operated with the thumb of the hand in~~  
*the unit can be held and operated with one*  
~~which it is held.~~  
*hand.*

Operation in local position:

- Turn the toggle switch to "ON" position (allow 45 seconds <sup>oscillation</sup> for fork to build up).
- Press the push button. (1 fig 2)
- The output is taken from the IPC JACK (2 fig 2)

*Remote Operation:*

~~Operation of remote:~~ Complete remote control may be obtained

by proper connection to the four pin Winchester plug and

associated tie point. Please refer to the schematic diagram. *fig 1*

- To switch internal battery have <sup>toggle switch</sup> SW1 open and connect external switch to B and C of Winchester plug, *(3 fig 2)*.
- To switch output connect push button switch to TP1 and point D of Winchester plug.
- To use remote battery remove internal battery and connect a 1.5 volt cell to points A and B of Winchester

plug.

4.2. In order to prevent damage to the unit by connecting a battery in the reverse polarity, a polarity correcting circuit has been incorporated. When operating in the remote position, remove the internal battery as in paragraph 4.1. (c).

#### V. MAINTENANCE

The IN-3 reference amplifier and controls are ~~incorporated~~ <sup>encapsulated</sup>.

~~The tuning fork may be removed and used in another amplifier circuit. Maintenance is limited to replacement of the recommended 1.5V cell.~~  
<sup>battery</sup>  
1