DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DEVIATION CALIBRATOR MOTOROLA MODEL MU 140-70

Headquarters, Department of the Army, Washington DC
4 August 1980

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Section I. IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. *a.* This bulletin provides information for the periodic calibration of Deviation Calibrator model MU 140-70. The Deviation Calibrator being calibrated is herein referred to as the TI (test instrument).

b. Model Variations. When production and engineering changes are incorporated into the MU 140-70 Deviation Calibrator, a version number is suffixed to the model number. Thus the MU 140-70 becomes the MU 140-70-1. This suffix is stamped on the TI at the time of production. If a number does not appear after the model number, the version is understood to be "-O." These changes do not affect the calibration

c. Time and Technique. The time required to perform this calibration is approximately 2 hours using the dc low frequency technique.

2. Calibration Data Card (DA Form 2416). *a.* Forms, records, and reports required for calibration personnel at all levels are prescribed by TM 38-750. DA Form 2416 must be annotated in accordance with TM 38750 for each calibration performed.

b. Adjustments to be reported on DA Form 2416 are designated (R) at the end of the sentence in which they appear. When adjustments are in tables, the (R) follows the designated adjustment. Report only those adjustments made and designated with (R).

3. Calibration Description. TI parameters and performance specifications which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications*
Power input	105 to 125 vac, 60 HZ.
Power drain	1 watt @ 117 vac.
Oscillator frequency and stability	68.06 fixed; ± 0.02 MHz. 71.94 fixed; ± 0.02 MHz.
Switching frequency and stability	25 kHz; ± 2 kHz.

*These specifications are for information only and are not necessarily verified in this procedure.

Section II. EQUIPMENT REQUIREMENTS

4. Equipment Required. Table 2 identifies the specific equipment used in this calibration procedure. Alternate items may be used by the calibrating activity when this equipment listed in table 2 is not available. The items selected must be verified to perform satisfactorily prior to use and must bear evidence of current calibration. The equipment must meet or exceed the minimum use specifications listed in table 2. The accuracies listed in table 2 provide a four-to-one accuracy ratio between the standard and the TI.

5. Accessories Required. The accessories listed in table 3 are to be used in this calibration procedure. When necessary, these items may be substituted by equivalent items, unless specifically prohibited.

Table 2. Equipment Required

Item number	Common name	Minimum use specifications	Calibration equipment Type nr and/or mfg. Nr.
A1	Multimeter	Range: O to -50 volts Accuracy: ± 4%	ME-26 ( )/U, Hewlett-Packard Model 410B or C.

Table 3. Accessories Required

Item		Description
B1	Test Lead	Test lead, red, supplied with multimeter A1, with alligator clip adapter.
B2	Test Lead	Test lead, black, supplied with multimeter A1, with alligator clip adapter.

Section III. PRELIMINARY OPERATIONS

6. Preliminary Instructions. *a.* The instructions outlined in this section are preparatory to the calibration process. Personnel should become familiar with the entire bulletin before beginning the

b. Items of equipment used in this procedure are referenced within the text by common name and item identification number as listed in tables 2 and 3. For the identification of equipment referenced by item numbers prefixed with A, see table 2, for prefix B, see table 3.

WARNING

HIGH VOLTAGE is used during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NOTE

Unless otherwise specified, all controls and control settings refer to the TI.

7. Preliminary Procedures *a.* Open TI and carefully remove inner chassis from the case.

b. Place the inner chassis on a nonmetalic working surface.

c. Energize TI and allow sufficient time for warmup and stabilization.

NOTE

Unless otherwise specified, verify the results of each test and take corrective action whenever the test requirement is not met before continuing with the calibration.

Section IV. CALIBRATION

8. Peak Negative Voltage. *a.* Performance Check.

(1) Connect multimeter (Al) between TI TP 1 (fig. 1) and chassis ground.

(2) Observe that the indication on the multimeter is between -6.0 and -6.5 or slightly greater. If not, perform b(l) below.

(3) Connect multimeter between TP 2 and ground.

(4) Observe that the indication on the multimeter is between - 6.0 and -6.5 or slightly greater. If not, perform b(2) below.

b. Adjustments

(1) Tune TI coil L3 for a maximum negative voltage. (R)

(2) Tune TI coil L4 for a maximum negative voltage. (R)

NOTE

The most negative reading will usually be obtained at the peak with the coil tuning slug furthest out. If any components in the TI have been replaced, coils L1, L2, L3, and L4 should be retuned. Tank circuit coils L3 and L4 are to be tuned to produce maximum negative readings at TP 1 and TP 2. Output coils L1 and L2 are tuned for maximum output.

9. Final Procedure. *a.* Deenergize and disconnect all equipment and reinstall TI in protective cover.

b. In accordance with TM 38-750, annotate and affix DA Label 80 (US Army Calibrated Instrument). When the TI receives limited or special calibration). When the TI cannot be adjusted within tolerance, annotate and affix DA Form 2417 (US Army Calibration System Rejected Instrument).

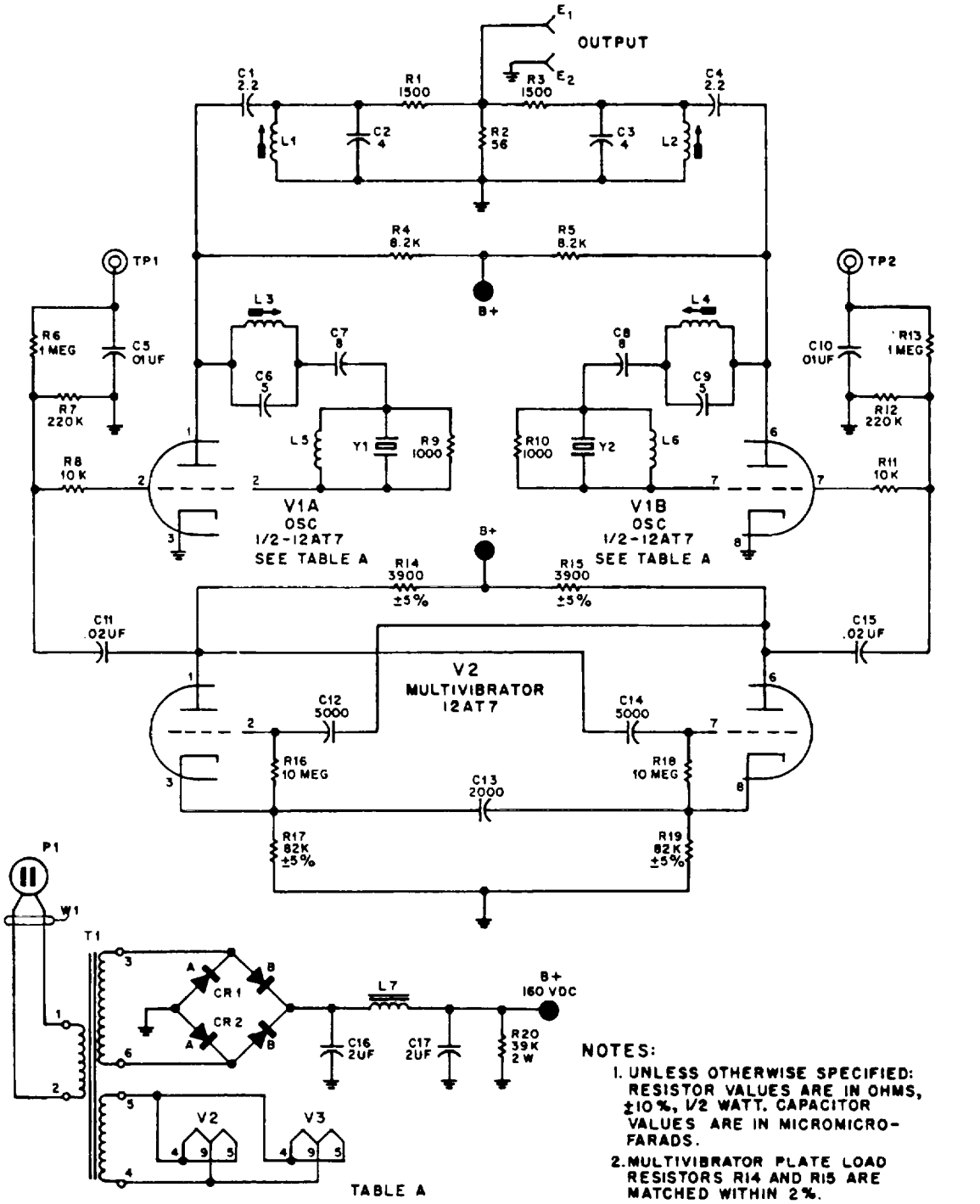

TABLE A

MODEL NUMBER	OSC. A		OSC. B	
	FREQ MC	Y1 MC	FREQ MC	Y2 MC
MU140-70	71.94	35.97	68.06	34.03
MU140-75	73.06	36.53	76.94	38.47

NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTOR VALUES ARE IN OHMS, ±10%, 1/2 WATT. CAPACITOR VALUES ARE IN MICROMICRO-FARADS.
2. MULTIVIBRATOR PLATE LOAD RESISTORS R14 AND R15 ARE MATCHED WITHIN 2%.
3. MULTIVIBRATOR CATHODE RESISTORS R17 AND R19 ARE MATCHED WITHIN 2%
4. EXCEPT FOR FREQUENCIES OF Y1 AND Y2, THERE ARE NO DIFFERENCES BETWEEN THE MU140-70 AND MU140-75 BASIC CHASSIS, (SEE TABLE A)

EL4KD001

Figure 1. Deviation calibrator, schematic diagram.

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