

INSTRUCTION BOOK

RELATIVE FIELD STRENGTH METER



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SAFETY PRECAUTIONS

The following are general safety precautions that are not necessarily related to any specific part or procedure and do not necessarily appear elsewhere in this publication. These precautions must be thoroughly understood and apply to all phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe normal safety regulations. Do not attempt to replace parts or disconnect an RF transmission or any other high voltage line while power is applied. When working with high voltage always have someone present who is capable of rendering aid if necessary. Personnel working with or near high voltage should be familiar with modern methods of resuscitation.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into an enclosure for the purpose of service or adjustment of equipment except in the presence of someone who is capable of rendering aid.

SAFETY EARTH GROUND

An uninterruptible earth safety ground must be supplied from the main power source to test instruments. Grounding one conductor of a two conductor power cable is not sufficient protection. Serious injury or death can occur if this grounding is not properly supplied.

SHOCK HAZARD

Do not attempt to remove RF transmission line while power is present.

CHEMICAL HAZARD

Dry cleaning solvents used to clean parts may be potentially dangerous. Avoid inhalation of fumes and also prolonged contact with skin.

RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

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MODEL 4041 FIELD STRENGTH METER

Introduction

General

The Model 4041 Relative Field Strength Meter is an ultra sensitive, broad-band instrument for checking relative RF field intensity. Its nonreactive circuit utilizes modern solid state technology to detect even the faintest RF signal.

The Model 4041 is very easy to operate and its light-weight and compact design make it equally useful for bench or field operation.

Purpose and Function

The Model 4041 Relative Field Strength Meter was designed to detect even the slightest radiated RF signals. Its use is primarily for the tuning of antennas and output stages of base or hand held transceivers. It can also be used to adjust the output of garage door openers, radio control transmitters or other transmitting devices with frequencies within the 1 MHz to 1000 MHz frequency range.

SPECIFICATIONS
MODEL 4041 FIELD STRENGTH METER

Usable Frequency Range	1-1000 MHz
Typical Sensitivity Gain Control at MAXIMUM	1W of radiated power from a CW source at 150 MHz through a quarter wave antenna will cause an approximate full scale deflection at a distance of eight (8) feet.
Temperature Range	
Operating	0°C to 50°C (32° to 122°F)
Storage	-20°C to 50°C (-4° to 122°F)
Dynamic Range	
Gain Control	30dB approximate
Battery	
Type	9V alkaline transistor, Neda #1604A or equivalent
Life	200 hours minimum
Dimensions	1-15/16"L x 2-1/4"W x 4-3/8"H (49 x 57 x 111 mm)
Weight	10 oz. (.283 kg) approximate
Finish	Black anodized

SECTION I - THEORY OF OPERATION

1-1 **General**

1-2 Normally field strength meters have resonant reactive networks in which the RF signal is detected and then rectified to a half wave current. This signal is then indicated on a sensitive microammeter. This method, of course, is limited and not very useful for very weak signals.

1-3 The Model 4041 Field Strength Meter uses a broad-band nonreactive solid state circuit. This circuit amplifies the detected RF signal and delivers a dc voltage to a microammeter proportioned to the RF signal magnitude. The amplification of the solid state circuitry is regulated by the Gain control allowing the unit to be used for very low to high RF signal conditions.

SECTION II - OPERATION

2-1

General

2-1

The Model 4041 is very simple to operate. There are only two controls on the front of the unit, the Gain control and a Battery Test button. It is good practice to test the battery condition prior to each usage. Follow the steps below for proper operation:

- a. Turn Gain control slightly clockwise until a click is heard signifying the unit has been turned on.
- b. Depress the Battery Test button. The meter pointer should deflect to the right and indicate within the Battery region or upper 2/5 of the scale. If not, replace battery per SECTION III -Maintenance.
- c. Position unit several feet from the transmitting antenna. It may be hand held or stand vertical on any flat surface. Turn on RF power and adjust Gain control of field strength meter for a mid-scale pointer deflection. *Note - If little or no pointer deflection is observed, reposition the field strength meter closer to the transmitting antenna.*
- d. Adjust antenna and transmitter output according to the manufacturers instructions until a maximum deviation of the field strength meter's pointer is observed.
- e. When operation of the Model 4041 is complete, return the Gain control to the OFF position. For maximum battery life, always keep the unit in the OFF position.

SECTION III - MAINTENANCE

3-1 **General**

3-2 There is little or no maintenance required for the Model 4041 Field Strength Meter other than to occasionally replace the nine (9) volt battery. Do not drop the unit or subject it to hard blows. It is a ruggedly built unit, however the delicate meter movement may be damaged with severe impact. The meter movement may have to be set on the Zero mark occasionally. Do this with the Gain control in the Off position. The Zero adjustment is the small slotted screw head located on the front of the meter bezel. Use a small screwdriver to adjust this screw head slightly clockwise or counterclockwise until the pointer rests exactly on the ZERO mark.

3-3 **Cleaning**

3-4 Occasionally clean the outside surface of the unit. Use a soft cloth dampened with a mild detergent solution. Do not use any abrasive cleaners that may scratch the meter face.

3-5 **Battery Replacement**

3-6 The operation of the Model 4041 will be affected by a weak battery. If the battery shows weak with the battery test, it should be replaced immediately. If the unit is to be inoperative or stored for any length of time, it is wise to remove the battery.

3-7 The battery is situated in a holder inside the back of the meter housing cover. To release the cover and replace the battery, follow the steps below:

- a. On the back of the meter housing cover are two (2) screws that secure the cover to the meter housing. These screws are located at the top and bottom center of the cover. Using a screwdriver, loosen these screws counterclockwise one-half turn only. The cover should pull straight off of the meter housing.
- b. Separate the cover from the meter housing carefully. There are wires that connect from the circuit board to the battery. These wires can be broken from the circuit board by excessive force.

- c. Remove the battery from the battery holder and disconnect the snap connector.
- d. Replace the battery and reassemble the unit by reversing the procedures above.

3-8 **Meter Replacement**

3-9 If, in the unlikely event, the meter should need replacing, open the meter housing as described in step 3-7a. of the Battery Replacement Procedure.

- a. Remove the two (2) Phillips head lug screws that secure the connecting wires.
- b. Remove the four (4) nuts and washers from the mounting studs that secure the meter to the housing.
- c. The meter is now detached and may be withdrawn through the front of the meter housing.
- d. Reverse the above procedure to replace the meter. Observe correct polarity when reconnecting the wires to the meter lugs. Orange wire to positive lug.

3-10 **Antenna Replacement**

3-11 The antenna may be removed simply by grasping it securely at the base and unscrewing it counter-clockwise. It has a standard 5/16-32 thread and may be exchanged with any other antenna with the same screw mounting.

3-12 Gain Control Knob

- 3-13 The Gain control knob is removed by loosening the two set screws with a 1/16 Allen wrench. When the set screws are loosened the knob will pull straight off. To replace the knob simply reverse the procedure above. When re-attaching the knob be sure the **Arrow** on the knob skirt points to **Off** when the switch is in the **Off** position.

3-14 Circuit Board

- 3-15 The circuit board is not generally field replaceable. If in the unlikely event of circuit board or circuit component failure, we advise that the unit be returned to the factory for repair or replacement.

SECTION IV - REPLACEMENT PARTS LIST

4-1 Item	Model 4041 Qty.	Description	Part Number
1	1	Microammeter	2120-014
2	1	Antenna	5-1422
3	1	Gain Control Knob	5-1137-1
4	1	Battery, 9 volt, Neda #1604A	5-1375
5	1	P.C. Board Assembly	4041-005