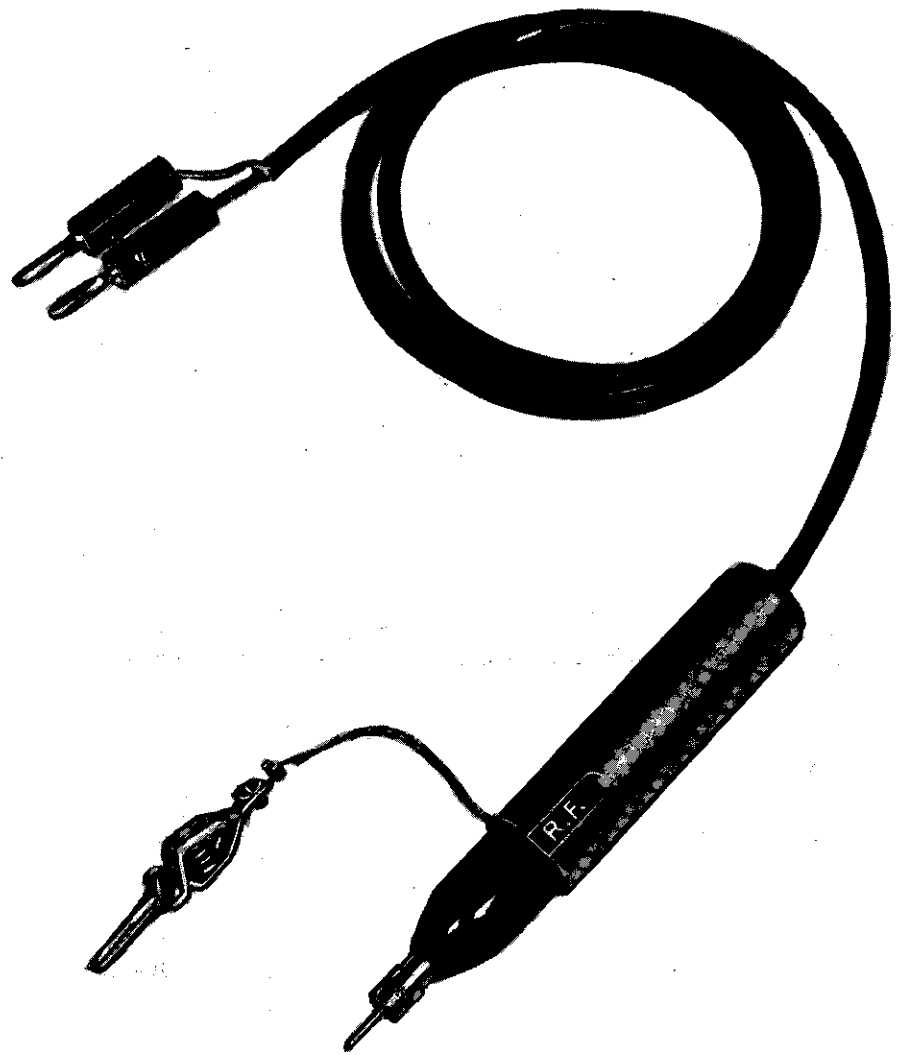


# THE KNIGHT DEMODULATOR PROBE



**ALLIED RADIO**

CORPORATION

100 N. WESTERN AVE. • CHICAGO 80, ILL. HAYMARKET 1-6800



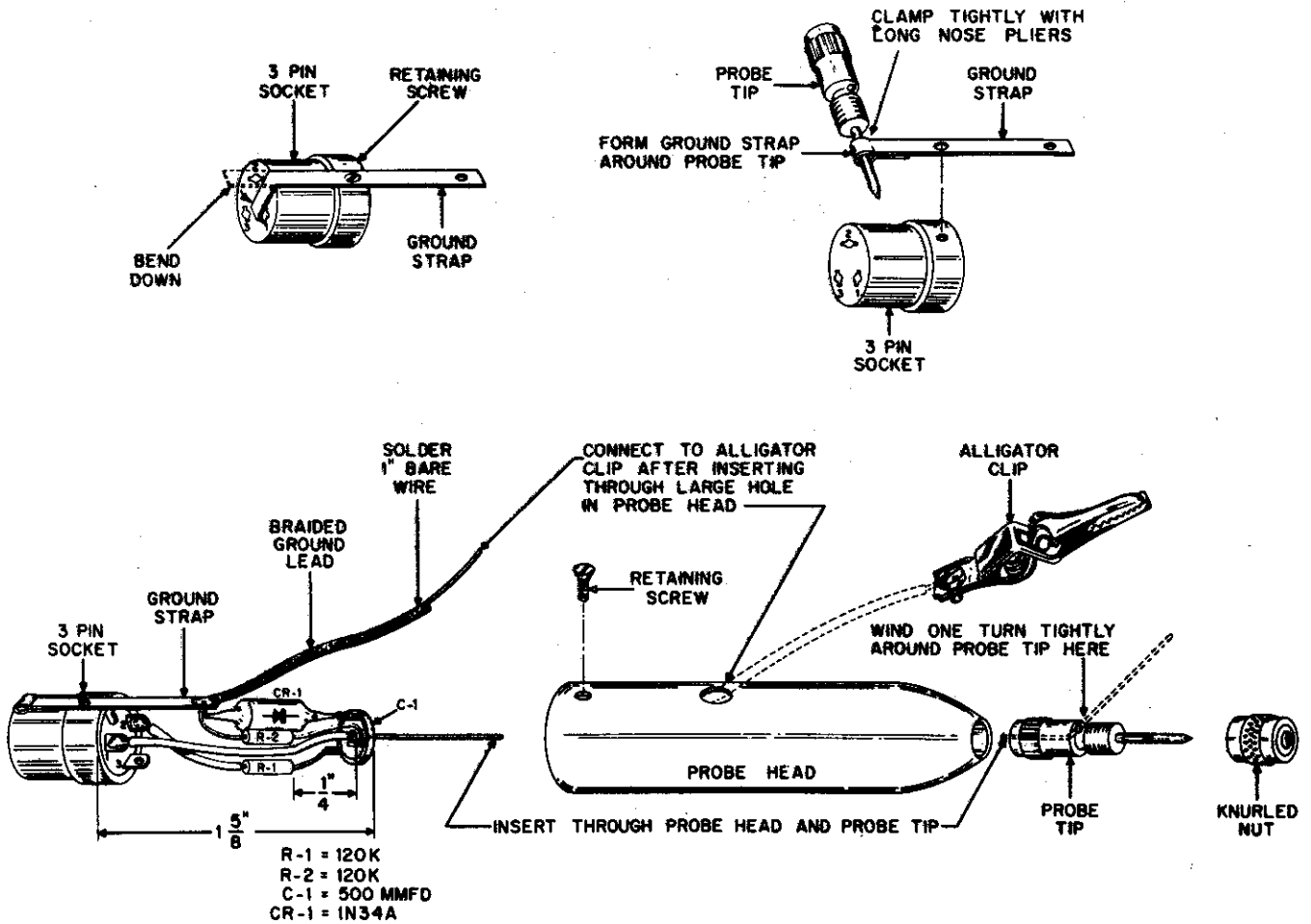


FIGURE 1. HOW TO ASSEMBLE THE PROBE HEAD

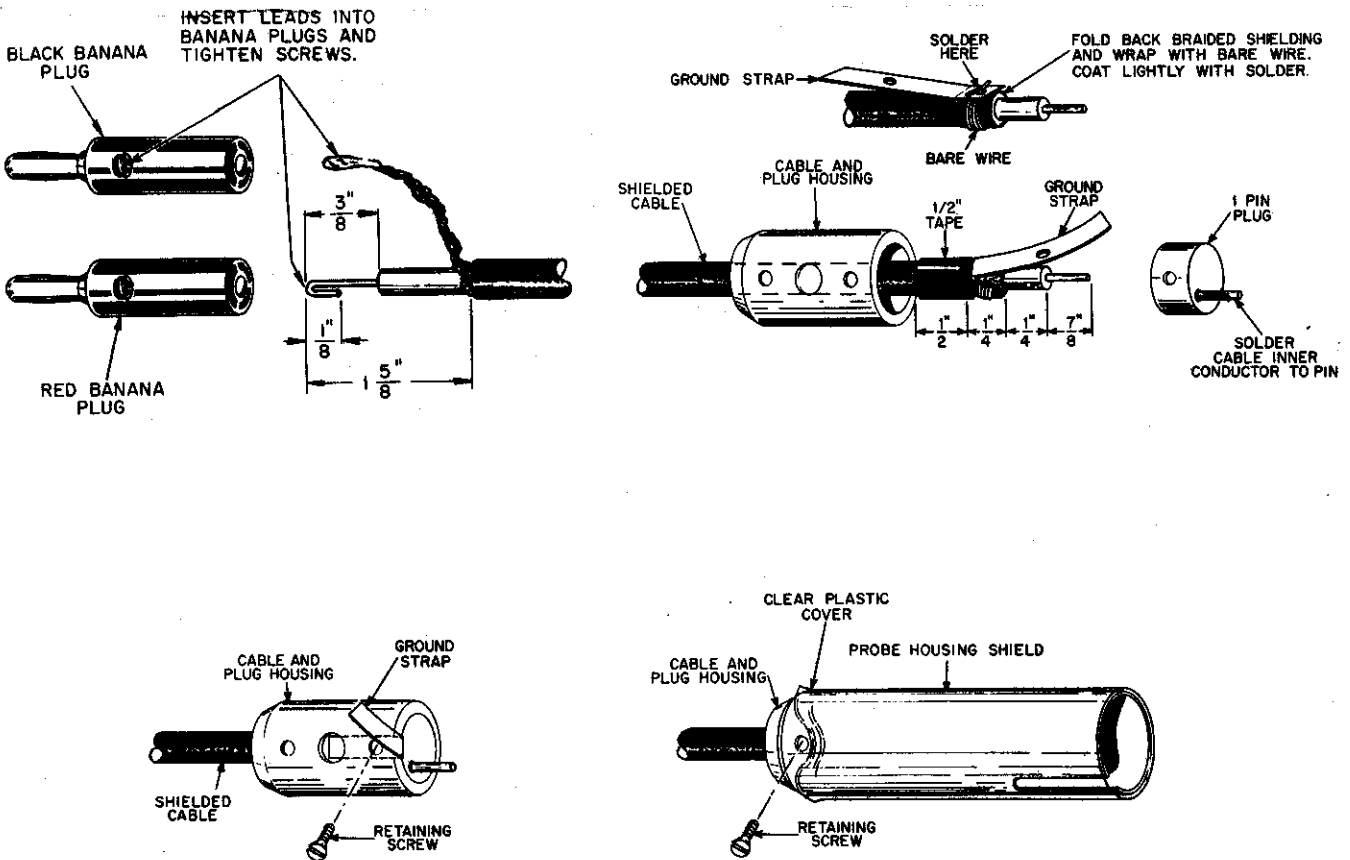


FIGURE 2. HOW TO PREPARE AND CONNECT THE CABLE

# THE KNIGHT DEMODULATOR PROBE

## INTRODUCTION

The usefulness of an oscilloscope is greatly increased when a demodulator probe is used in conjunction with it. Using the demodulator probe it is possible to observe modulation envelopes of RF and IF up to 250 MC.

When you unpack your probe kit, check all of the

parts against the Parts List. Study the diagrams so you understand the assembly of the parts.

**USE ONLY ROSIN CORE SOLDER. KITS WIRED WITH ACID CORE SOLDER OR ACID FLUX WILL CORRODE AND WILL NOT WORK LONG. SUCH KITS ARE NOT ELIGIBLE FOR REPAIR OR SERVICE.**

## PROBE HEAD ASSEMBLY

SEE FIGURE 1.

- Solder one end of a 4 inch bare wire to terminal 1 of the 3-pin socket. Place a 1¼" length of spaghetti on the other end of the wire and push it down until it touches the terminal on the socket. Now, insert the end of the bare wire through the center hole of C-1, the button capacitor. Push C-1 down until it touches the top of the spaghetti. Then, solder the wire in the center hole.
- Attach the ground strap to the 3-pin socket. Bend the end down over the edge of the socket as shown. Remove the ground strap from the socket and form it around the probe tip as shown.
- Re-attach the ground strap to the 3-pin socket.
- Cut one lead of R-2, 120K ohm resistor (brown, red, yellow), so that it is ¼" long. Solder this lead to one of the terminals on C-1.
- Insert the other lead of R-2 through the small hole in the ground strap.
- Note that CR-1, the crystal diode, has an **ARROW HEAD** marking on one end and a **BAR** marking on the other end. This marking may be a dot or a "K", which corresponds to the bar. Keep both leads of CR-1 as short as possible. Solder the lead from the end with the **BAR** on it to one of the terminals of C-1. Insert the other lead through the small hole in the ground strap.
- Punch a small hole in one end of the braided

ground lead. Insert the two leads coming through the hole in the ground strap through the hole in the braided ground lead. Solder the braided ground lead and the two component leads to the ground strap.

- Cut one of the leads of R-1, 120K ohm resistor (brown, red, yellow), so that it is ¼" long. Solder this lead to the remaining terminal on C-1.
- Place a ¾" length of spaghetti on the other lead of R-1. Solder this lead to terminal 2 on the 3-pin socket.
- Remove the screw holding the ground strap to the socket.
- Insert the assembled parts into the probe head. Pull the braided ground lead through the hole in the side of the probe head. The small hole in the side of the 3-pin socket must line up with the small hole in the probe head. Tighten one of the small screws into this hole.
- Remove the knurled nut from the probe tip. Pass the bare wire through the hole in the probe tip. Then press the tip into the end of the probe head. Wrap the wire once around the shoulder of the probe tip. Cut off the excess wire and replace the knurled nut.
- Solder one end of a 1" length of bare wire to the braided ground lead. Connect the other end of the bare wire under the screw of the alligator clip.

## CABLE ASSEMBLY

SEE FIGURE 2.

- Place the cable and plug housing over one end of the shielded cable
- From this end of the cable, remove 1½" of the outer insulation. Unravel the braided shielding. Wrap the unraveled shielding around the end of the cable's outer insulation.
- Wrap 3 turns of bare wire around the shielding.
- Place the small hole of the ground strap over the two ends of the bare wire.
- Coat the end of the ground strap, the bare wire, and the shielding with solder. Be careful not to apply too much heat or you will melt the insula-

tion around the inner conductor.

- Remove ⅞" of insulation from the inner conductor. Insert the inner conductor into the pin of the 1-pin plug and solder it.
- Fold the ground strap back toward the 1-pin plug. Line up the hole in the ground strap with the hole in the plug.
- Remove the tape wrapped around the probe housing shield. Wrap it around the cable.
- Slide the cable and plug housing down onto the plug. Line up the hole in the end of the cable and plug housing with the holes in the ground strap and the plug. Tighten a small screw into this

hole. Bend the ground strap back over the cable and plug housing.

- Insert the cable and plug housing into the probe housing shield. Push back the plastic cover and fasten the parts together with a small screw.
- Remove 1 5/8" of outer insulation from the other end of the cable. Unbraid the shielding and twist it together to form a ground lead. Coat the end of

### FINAL ASSEMBLY

Insert the probe head assembly into the probe shield. The pin on the plug inside the shield must fit into one of the holes of the socket on the probe head. Only the two holes corresponding to DIRECT and R.F. positions marked on the probe head are used. The probe position in use is indicated in the slot on the probe shield. To change the probe function, pull out the probe head and rotate it.

### ALLIED'S SERVICE FACILITIES

In the event that the kit does not operate properly, please write our Kit Department with full details and include the stock number and the date of purchase of the kit. We may be able to determine any wiring error or replace a component which may be at fault.

This wired KNIGHT kit may be returned for inspection within 1 year after purchase for a special service charge of \$1.00. Parts within the standard RETMA 90-day warranty period will be replaced without charge for the parts. An additional charge will be made for parts damaged in construction or because of a wiring error, or for parts which are beyond the 90-day warranty period. After the one-year period, service charges, plus cost of parts, are based on the length of time required to repair the unit.

**PLEASE NOTE: KITS WIRED WITH ACID CORE SOLDER OR ACID FLUX ARE NOT ELIGIBLE FOR REPAIR OR SERVICE AND WOULD HAVE TO BE RETURNED NOT REPAIRED AT YOUR EXPENSE.**

Allied's facilities primarily provide an inspection and troubleshooting service. Kits not completed, which require extensive work, will be returned collect with a letter of explanation.

If you must return this kit, pack it well. Use the original packing carton with cushioning material around the probe. Send the kit prepaid and insured. We will return the repaired kit to you C.O.D. as soon as repairs are completed. If you wish to save C.O.D. fees, your advance remittance may be enclosed for standard repair charges, plus transportation costs. Any excess remittance will be refunded.

### ALLIED'S GUARANTEE ON KNIGHT KITS

The designs and components selected for KNIGHT kits represent over a quarter of a century of experience in kit development. KNIGHT kits are easy to assemble even for the beginner. Instructions are complete, panels are drilled, the chassis is punched and formed, and every last part is included as listed.

Allied extends these firm guarantees on KNIGHT kits:

We guarantee that the circuits on all KNIGHT kits have been carefully engineered and tested.

We guarantee that only high-quality components are supplied. All parts are covered by the standard RETMA 90-day warranty. Any faulty components will be replaced prepaid and without charge if reported to us within the warranty period. We reserve the right to request the return of defective parts.

If your kit was shipped by parcel post and received in a damaged condition, please write us at once describing the condition. If your kit was part of a Railway Express shipment that was damaged in transit, please notify the Railway Express agent at once and then write us.

Allied Radio cannot accept responsibility or liability for injury or damage sustained in the assembly or operation of the kit.

The efficiently engineered KNIGHT kits are moderately priced. When you buy a KNIGHT kit you get the best in design, quality, and value. Recommend KNIGHT kits to your friends.

the shield lead lightly with solder.

- Remove about 3/8" of insulation from the inner conductor. Fold the end of the inner conductor back about 1/8".
- Place the black banana plug on the shield lead and tighten the screw.
- Place the red banana plug on the inner conductor and tighten the screw.

### USING THE PROBE

The button capacitor is rated at 500 volts DC and should not be applied to circuits where DC voltages higher than this are found. AC or RF voltages greater than 30 volts rms should not be measured as damage to CR-1, the crystal diode, may result. Ordinarily, this probe will not be damaged by application of the signal voltages from a television receiver's RF, IF, or 4.5 MC circuits. Any contact with the high voltage sweep circuits will burn out the crystal diode.

This demodulator probe can be used in signal tracing a television receiver's RF, IF, 4.5 MC sound, and video amplifier circuits or any other test which requires demodulation, so long as the test voltage does not exceed 30 volts rms. The signal voltage in RF circuits may be too low to provide a satisfactory display on the oscilloscope screen. Therefore, it may be necessary, when signal tracing RF circuits, to provide a signal with a sweep generator.

C-1, the 500 MMFD capacitor, charges to a voltage almost equal to the peak of the signal voltage being measured. This voltage is rectified (demodulated) by CR-1, the crystal diode. R-2 functions as a bleeder resistor. R-1 is an isolating resistor.

### PARTS LIST

SYMBOL NUMBER	DESCRIPTION	ALLIED PART NO.
C-1	Capacitor, feedthrough, 500 MMFD	296003
CR-1	Crystal diode, type 1N34A	7E236
Note: When ordering resistors give part number and description.		
R-1	Resistor, 120K ohm, 1/2 watt	2MM040
R-2	Resistor, 120K ohm, 1/2 watt	2MM040

QUANTITY	DESCRIPTION	ALLIED PART NO.
1 ea.	Probe head	870018
1 ea.	Probe tip	502118
1 ea.	Socket, 3-pin	502280
1 ea.	Plug, 1-pin	502190
1 ea.	Cable and plug housing	870018
1 ea.	Insulated probe housing shield	470052
3 ea.	Retaining screw, probe	563280
2 ea.	Ground strap	470048
1 ea.	Alligator clip	45N080
1 ea.	Banana plug, red	41H405
1 ea.	Banana plug, black	41H410
4'	Shielded cable, RG-58/U	49W485
3'	Spaghetti	812005
4"	Bare wire	808011
4"	Tape	811001
7"	Solder	880007
2 1/2"	Braided ground lead	804008
1 ea.	Instruction manual	760014

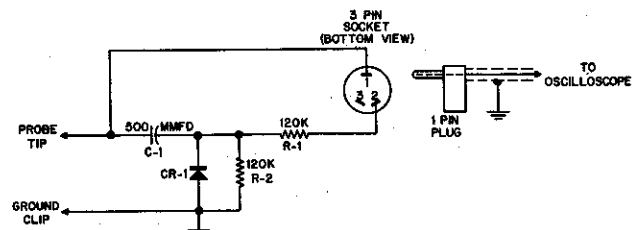
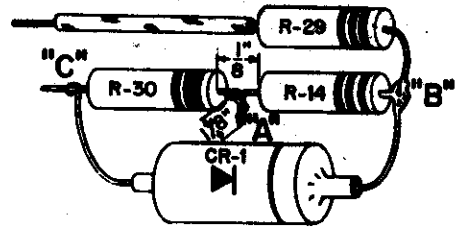
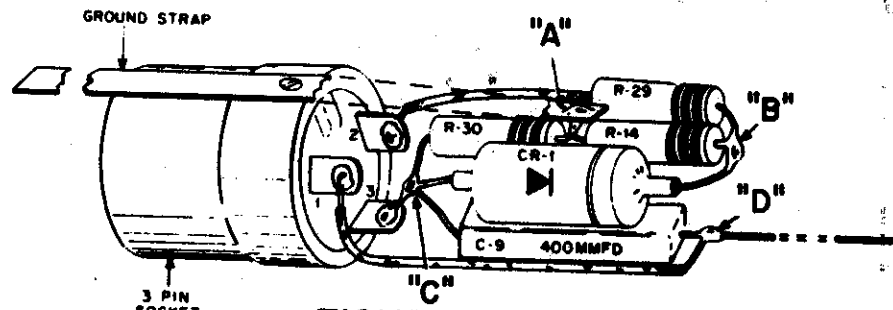


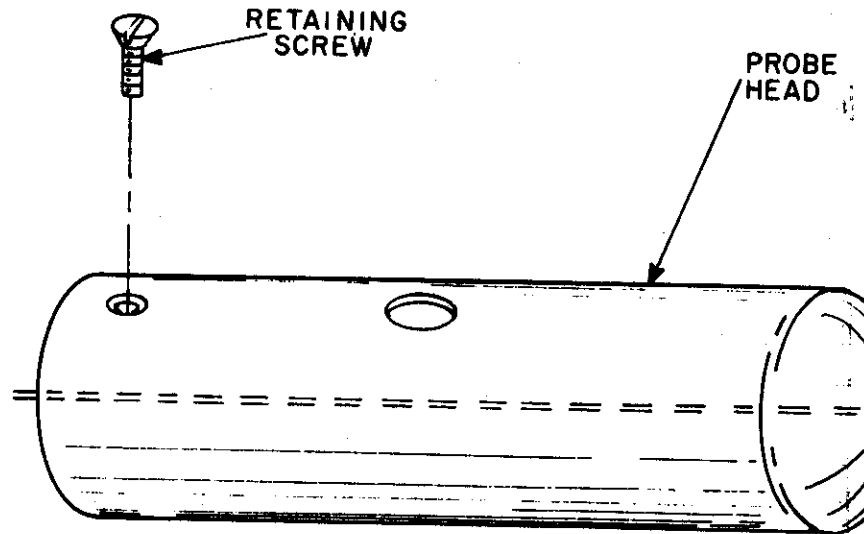
FIGURE 3. SCHEMATIC DIAGRAM



**FIGURE 15A**



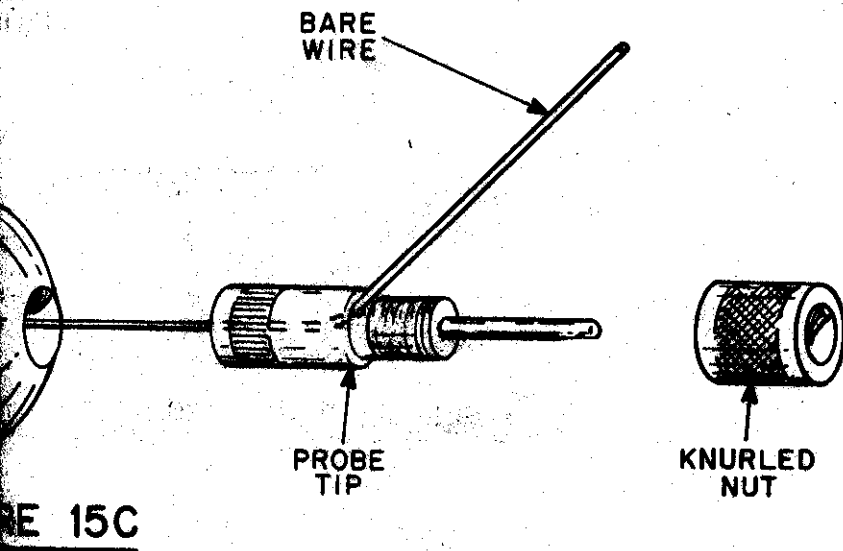
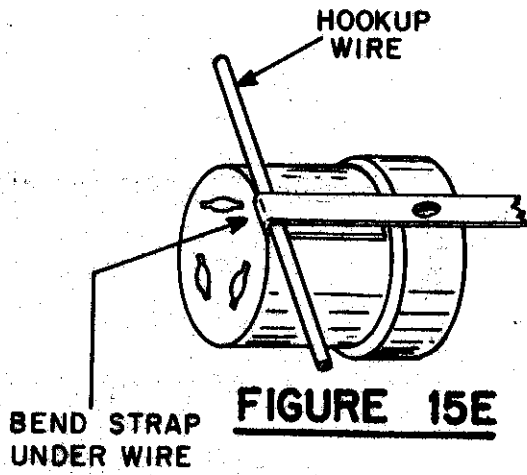
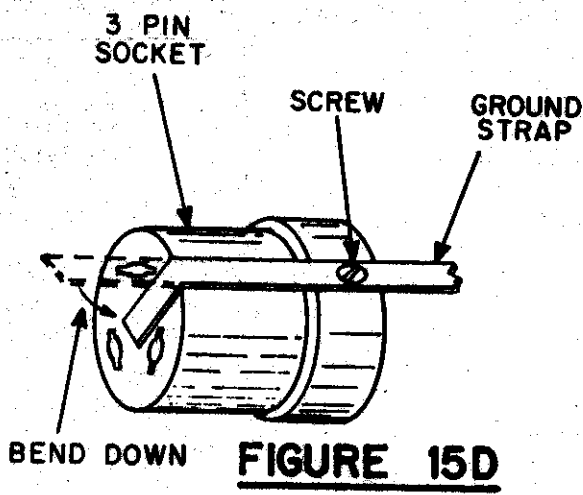
**FIGURE 15B**



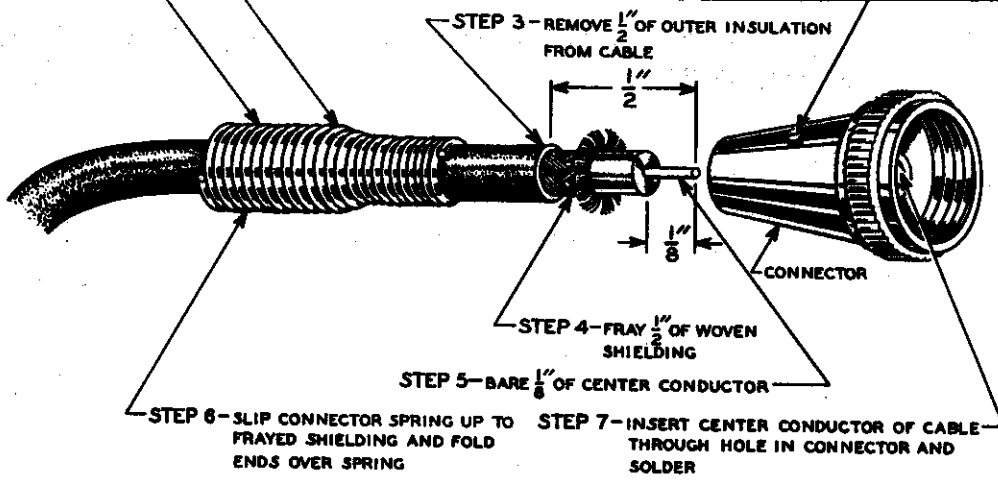
**FIGURE 15C**

**FIGURE 15. P**

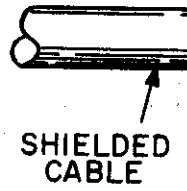
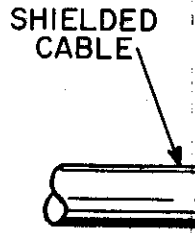
- STEP 1 - DISSASSEMBLE SPRING FROM CONNECTOR BY LOOSENING SCREW
- STEP 2 - SLIP SPRING OVER COAXIAL CABLE
- STEP 3 - REMOVE 1/4"
- STEP 4 - TIGHTEN SCREW ON SIDE OF CONNECTOR AGAINST SPRING



**PROBE ASSEMBLY**

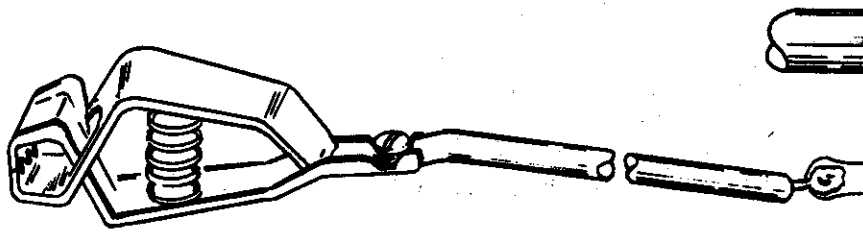


**FIGURE 16A**



**FIG**

**CABLE / PLUG HOU**

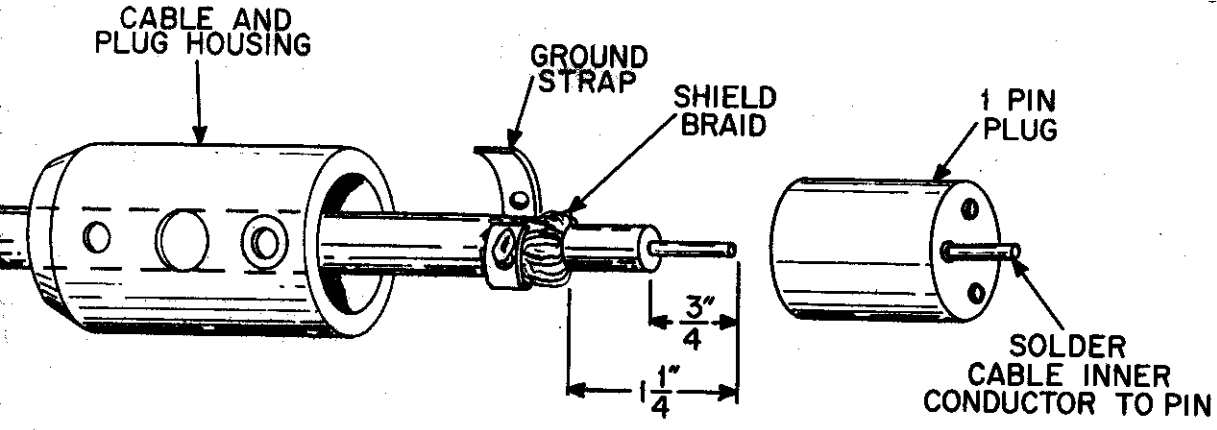


**FIGURE 16D**

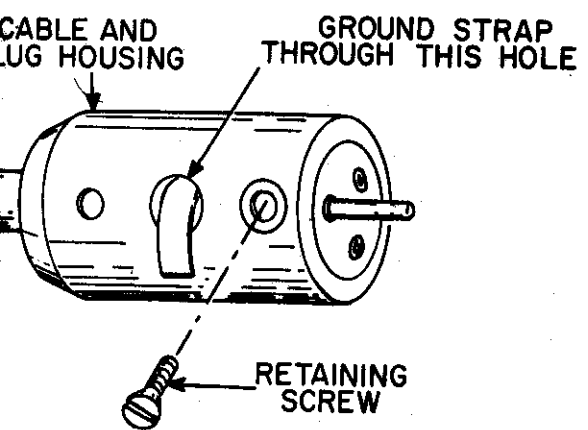
**FIGURE 16. CABL**

THE KNIGHT

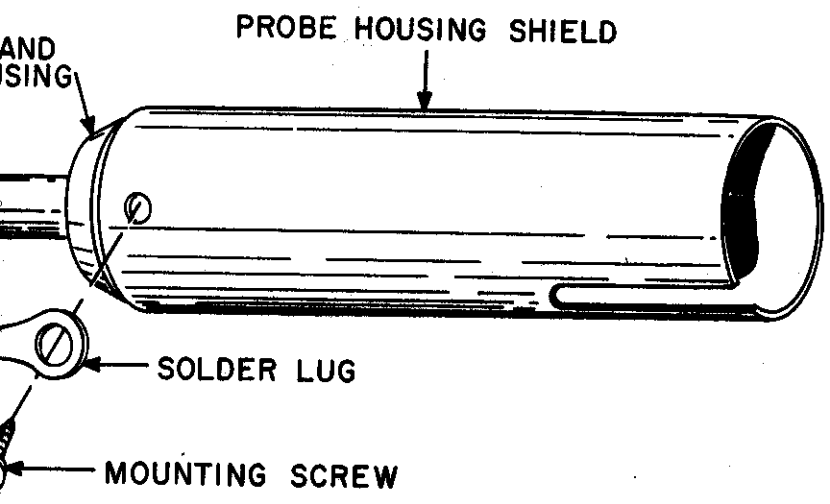
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**FIGURE 16B**



**FIGURE 16C**



**LE ASSEMBLY**

**IT SIGNAL TRACER**

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