

Radio-Electronics

JANUARY 1960

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New Series: Design Your Own Preamplifier

HUGO GERDSBACK, Editor

**Repair Your Own
Volt-Ohm-Milliammeter**

**How Infrared
Guides Missiles**

**Faster Servicing
For Record Changers**

**Citizens Band
Radios
Constructed
from Kits**

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**More Articles on
Industrial Electronics**

50c



JANUARY, 1960

Radio-Electronics

Formerly RADIO-CRAFT ■ Incorporating SHORT WAVE CRAFT ■ TELEVISION NEWS ■ RADIO & TELEVISION

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The author's son proves that at least some of the operations of wiring up a Citizens radio set are so simple as to be boy's play.

Color original by Jacques Saphier

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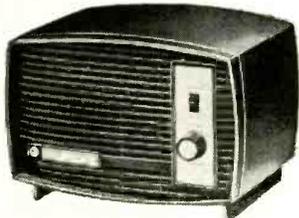
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ELECTRONICS

More hints from a TRANSITHUSIAST'S WORKSHOP

*Nine more aids for the
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that will save him time
and cash*

By **MARTIN KLEIN**

HAVE you ever realized that the amplifier of your six- (or more) transistor radio will also make a handy signal tracer? Just run two leads from the amplifier input (usually the volume control) to a new jack. Make a simple probe with a capacitor and a diode, and you are all set (see Fig. 1). Of course, by leaving out the diode it becomes a general-purpose loudspeaker amplifier or audio signal tracer.

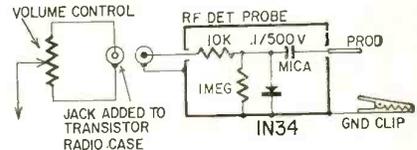


Fig. 1—Probe connected to jack added across volume control converts radio into portable signal tracer.

Mica for power transistors

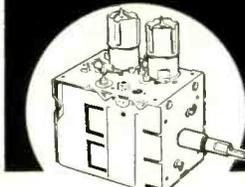
Most manufacturers recommend using a thin sheet of mica to insulate a power transistor from its heat sink. You can get a good supply of these sheets by taking apart a large (0.1 μ f or larger) mica capacitor. These usually consist

of several dozen sheets which are coated with a metallic substance. Thin slices may be easily cut with a sharp razor blade, and the same tool will scrape off the metallic coating.

Transformer leads

The loss of a lead on a tiny trans-

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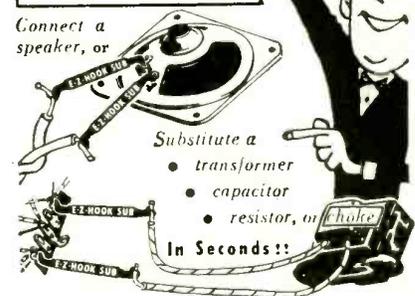
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former can sometimes be even more disastrous than a broken transistor. The leads are usually not attached very firmly and, after losing two good transformers by accidentally pulling out the leads, I devised a simple method to put an end to this. Just take the leads of the new transformer and fold them back along the sides. Next tape them down (Fig. 2). This takes the pressure off the delicate connection and almost nullifies the chance of breakage. An even better way might be to mount the transformer on a tiny terminal board with lugs, but this might waste some of the precious room in a miniature project.

Subminiaturizing

There is a simple way to subminiaturize the popular Raytheon CK722. Just slowly chip away the case of the transistor (filing is safer, but don't let friction generate too much heat) until you get to the inner metal shell. A careful job will yield a transistor almost 75% smaller, perfect for ultra-miniature work. Remember to keep track of the collector lead, since there is no red indicator dot on the inner metal case.

Regeneration controls

The builder of a transistor radio often finds that using subminiature pots as regeneration controls leaves something to be desired. Their range is crowded and it is often difficult to

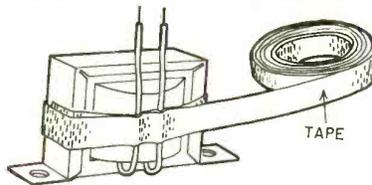


Fig. 2—Taping leads to transformer prevents pulling the leads out accidentally.

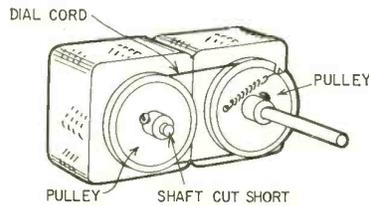


Fig. 3—Strap two miniature variable capacitors together and you have a dual unit.

get that critical setting for maximum sensitivity. You will find that one of the small industrial types do a much better job. These tiny, multiturn potentiometers are ideal when you need very accurate settings.

Dual 365- μ f variable

Many transistor superhet circuits specify a dual 365- μ f variable. Unfortunately, this value has not yet come out in a dual unit of the really miniature type. You can make one out of two
(Continued on page 104)



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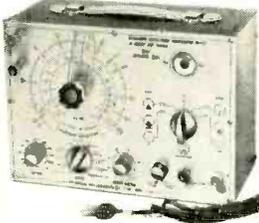


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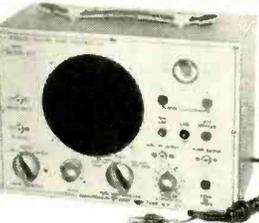
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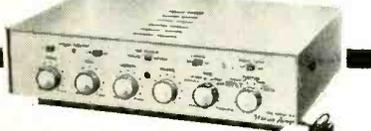
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ELECTRONICS

(Continued from page 99)

individual 365- μ mf miniature units (such as Argonne AR-274). Place them side by side and glue them together. Now attach a tiny pulley to each shaft and string them together with dial cord. Make the cord tight to prevent slippage. Now cut one shaft short and put the knob on the other (Fig. 3). The one knob will control both units and you will have a very small dual 365- μ mf variable.

Heat sinks

To get maximum efficiency from heat sinks used for power transistors, paint them dull black. Black is a much better radiator of heat, so that a small black heat sink might be much better than a larger shiny one. You can also use this principle for ordinary transistors. If a transistor is going to be near something warm, paint it with a shiny aluminum paint. If you are worried about the transistor itself heating, paint it dull black so it can easily radiate its excess heat.

Color-code transistors

After a time, the experimenters build up a supply of transistors. A handy way to identify them quickly would be to color-code them in a manner similar to the resistor color code. The first two (or three) numbers could show the transistor's beta or current gain. The

next band could be gold or silver for n-p-n and p-n-p, respectively. You could use another notation for function, so you could easily spot an audio, rf or any other kind of unit. About 10 colors of 10-cent bottles of paint such as Testor's Pla (available at a hobby store) will code hundreds of transistors for rapid identification.

Holding thin wires

Sometimes it is difficult to hold very thin wires in ordinary alligator clips, since the wire slips through the teeth. The problem can be easily remedied by filing off the teeth. Now the jaws will be flush and the tiny wire will be gripped easily, putting an end to the slipping. **END**

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