

Heathkit of the Month #119:
by Bob Eckweiler, AF6C

Heathkit

ELECTRONIC TEST EQUIPMENT

Heathkit Accessory Probes – Part II: Oscilloscope:

Introduction:

In HotM #118 the accessory probes used with Heathkit vacuum-tube-voltmeters (VTVMs), and the later FET analog and digital voltmeters, were discussed. In this article the probes designed to work with Heathkit (and in many cases, scopes manufactured by other companies) will be covered.

Two general types of o'scope probes were offered by Heath. One is the demodulator probe. The second is the low-capacitance probe; Heathkit, over the years offered many different types of low capacitance probes. In the later years, many of these probes were sold fully assembled and were from other manufacturers, but carried the Heathkit brand. **Figure 1** shows the PKW-101 x10 low capacitance probe good for up to 30 MHz.

Scope Demodulator Probes:

Early Heathkit scopes have a top frequency response from a few hundred kilocycles up to about 5 megacycles, the frequency response that is needed to service analog¹ color TVs. A demodulator probe allows the user to view on

Here is a link to the index of Heathkit of the Month (HotM) articles:

http://www.w6ze.org/Heathkit/Heathkit_Index.html

1. Notes begin on page 11

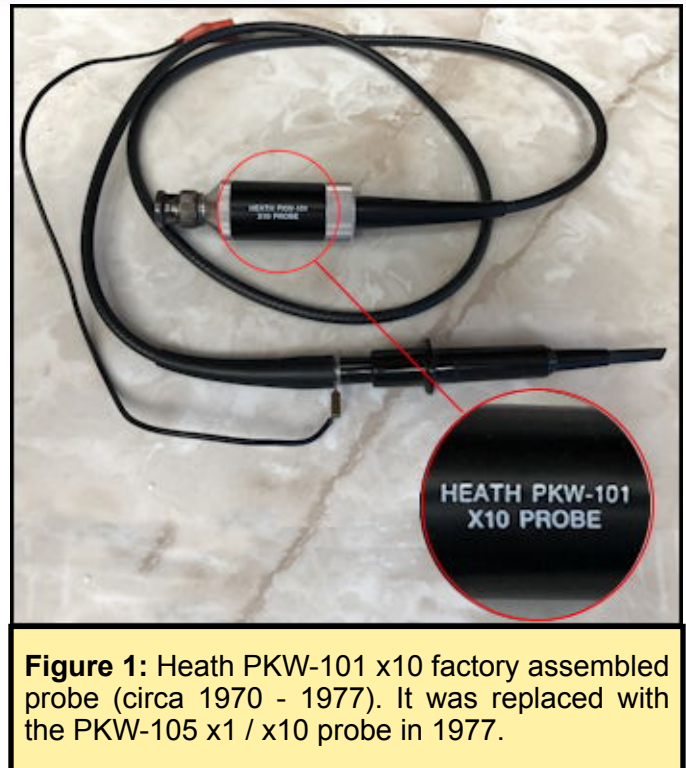


Figure 1: Heath PKW-101 x10 factory assembled probe (circa 1970 - 1977). It was replaced with the PKW-105 x1 / x10 probe in 1977.

the scope the signals riding on a carrier way beyond the frequency response of the scope. The typical TV IF (intermediate frequency) of the day was between about 20 and 45 mc; way too fast for Heathkit scopes of the time. The demodulator probe allows the TV repairman to look at the demodulated video and audio signals in the TV IF stages.

Low Capacity Probes:

Hooking a scope probe to an operating circuit can affect the operation of that circuit due to the added capacitance of the probe, its shielded test lead and the input capacitance of the scope. A low capacitance probe reduces the capacitance by trading off signal level for isolation. A common low-capacitance probe attenuates the signal by a factor of ten to provide the needed isolation. These probes are commonly called 10:1 or x10 probes. Many include a switch that allows the probe to be switched to a regular probe (1:1 or x1) when desired, and when the added probe capacitance is not a problem (usually at lower frequencies).

Heathkit’s Scope Probes & Accessories:

Heathkit sold 16 different probes and one accessory package for their oscilloscopes. The various items are listed in **TABLE I**.

Five probes are in the family of the #337. They are the original #337 followed by -A, -B and -C variations; there was also a factory assembled version of the -C variation given the model #337-WC designation. Some question whether the -A variation ever existed? It did and will be discussed when the #337 is detailed later in this article.

The #342 was the first Low-Capacity probe offered by Heathkit. When used with the current scopes of the time (O-7, O-8) it has an x10 attenuation. The probe came as a kit only.

The PK-1 replaced the #342. It is switchable between x1 and x10, and could be wired for different o’scope impedances. It is the last of the kit scope probes; the remaining only came factory assembled (many from a third-party manufacturer).

The PKW-2 is a switchable x1 - x10 probe designed specifically for the professional Heathkit IO-14 scope².

The PKW-101 is a x10 probe designed for newer scopes with a BNC connector and a one Meg Ω input impedance.

The PKW-104 was sold for a time alongside the PKW-101. This probe isn’t low-capacity, it is a x1 probe in style to the PKW-101.

Heath also sold an accessory package for the PKW-101 and PKW-104 (PKA-101-1) that included extra probe tips and ground clips.

The PKW-105 is a probe that was sold under numerous brand names. Pomona Electronics (PE), Zenith, Gould, AP, Heath and others.

The probe is manufactured in England as well as possibly the US, and it is believed that it first appeared as the PE 4550. Heath also offered the IOA-3220-1 which is a package of two PKW-105 probes at a discounted price.

For higher frequency scopes Heath offered the PS-250 (250 MHz BW) and the PS-350 (350 MHz BW). These came in sets of two as the faster scopes usually have at least two vertical channels.

| Heathkit Probes for Oscilloscopes | | |
|---|------------|---|
| # | Part # | Description |
| 1 | #337 | Demodulator Probe |
| 2 | #337-A | Demodulator Probe |
| 3 | #337-B | Demodulator Probe [a] |
| 4 | #337-C | Demodulator Probe [a] |
| 5 | #337-WC | Demodulator Probe [a] |
| 6 | #342 | Low Capacity Probe [a] |
| 7 | PK-1 | 1:1 / 10:1 Probe [a] |
| 8 | PKW-2 | 1:1 / 10:1 Probe for IO-14 [b] |
| 9 | PKW-101 | 10:1 Scope Probe [b] |
| 10 | PKW-104 | 1:1 Scope (& Counter) Probe [b] |
| 11 | PKA-101-1 | Accessory Kit for PKW-101/-104 |
| 12 | PKW-105 | 1:1 / 10:1 100 MHz Probe [b] |
| 13 | IOA-3220-1 | Set of two PKW-105 Probes |
| 14 | PS-250-2 | Set of two 1:1 / 10:1, 250 MHz Probes [b] |
| 15 | PS-350-2 | Set of two 10:1, 350 MHz Probes [b] |
| 16 | P-150 | 1:1 / 10:1 150 MHz Probe [b] |
| 17 | PS-150 | Set of two P-150 Probes [b] |
| [a] “red - aluminum - black” probe body style | | |
| [b] Factory or third party assembled probe | | |
| TABLE I | | |

Heath's last scope probe is the P-150 (150 MHz BW). It came out when Heath discontinued the PKW-105. Heath also offered the PS-150 which is a set of two P-150 probes.

Heath Scope Probe Details:

Later probes that were assembled from a kit and used the red - aluminum - black body also came with a sheet of decals (Figure 17) to identify the probe type. Here's a closer look at these scope probes:

#337 Demodulator Probe:

There are four versions of the #337 probe. Little information is available about the first two; however with some detective work, a good idea of these can be determined. If anyone has any information pro or con to these "best guess" descriptions, please feel free to contact the author and I'll make corrections.

A side article appeared in the December 1949 Heathkit flyer called "Build this Demodulator Probe for your Oscilloscope" (Figure 2). It describes a basic probe using a 1N34 crystal

Figure 2: In the December 1949 flyer Heathkit described how to build your own demodulator probe. It didn't become a kit until December 1951.

Figure 3: In the December 1951 flyer Heathkit first offered the #337 probe as a kit. Note that they gave a list of parts. Credit: Santos d'Silva

diode and a standard test prod, shielded cable and lugs to connect to the scope vertical input binding posts. It uses the capacitance of the length of shielded cable as well at the input capacitance of the scope to filter the RF and provide the demodulated signal.

The #337 was introduced in the December 1951 flyer (Figure 3). It spells out the parts used in the probe: "Probe kit consists of probe housing, crystal diode detector, shielded cable and two spade lugs." This exactly matches the parts described in the 12/1949 article except for the spade lugs, which are inconse-

Figure 4: #337 Probe as it is believed to originally appear, using a circa 1950's standard test probe. It compares closely to Figure 3.

quential. Later flyer ads confirmed the diode used is the 1N34. **Figure 4** is a closer view of what is believed to be the original #337 probe. This photo was used occasionally (and likely incorrectly) in later ads for the #337-A.

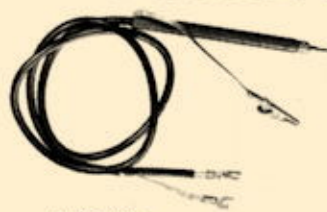
#337-A Demodulator Probe:

The #337-A is believed to have first appeared in the 1953 main catalog. The catalog entry is shown in **Figure 5**. Note in the text of ad the parts used are now described as a germanium diode, condensers, resistors, probe housing and shielded test lead along with a detailed assembly sheet³. Note the plural used for condensers and resistors. At least two of each. The updated circuit is likely for two reasons; to better protect the diode, and to scale the output so it more accurately represents the demodulated signal amplitude. The photo shown in **Figure 5** is identical to that of **Figure 4**, but it would be hard to believe a standard test probe could hold five components⁴. A later photo of the #337-A shows it in what is believed to be the correct probe body, the same one used by the #309 and later the #338, which has more internal room (**Figure 6**). The old part number for this probe body is: RF-19⁵ composed of RF-11 tip and RF-12 probe body and the new part numbers are 477-2 tip and 476-3 body. No record of the circuit schematic has been found, but it is assumed to be very close, if not identical, to the #337-B. The #337-A was offered again in the Summer 1953 flyer, this time the photo is believed to be correct. The #337-A was short lived, being replaced that September (1953) by the #337-B.

#337-B Demodulator Probe:

The #337-B appeared in September of the same year the #337-A was released. It is housed in the new "red - aluminum - black" probe body. The schematic is shown in **Fig-**

Heathkit
SCOPE DEMODULATOR
PROBE KIT



NO. 337A

\$450

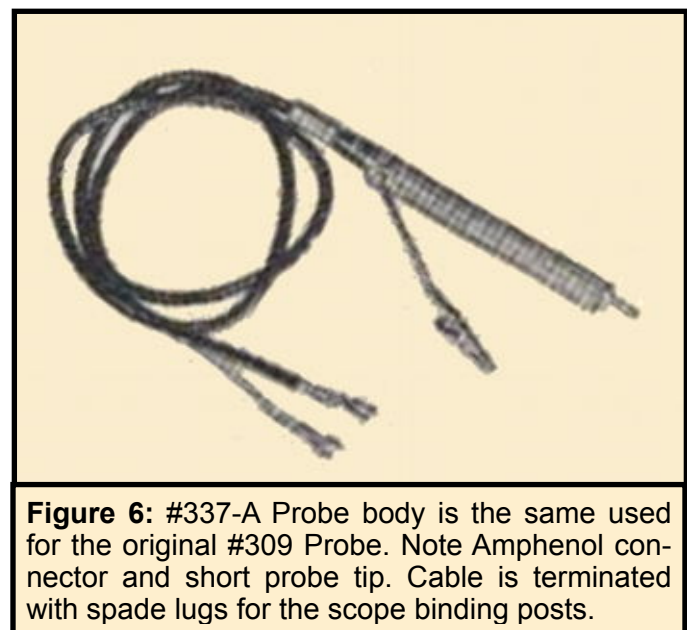
SHIPPING
WT. 1 LB.

In all types of Radio and TV servicing with an Oscilloscope, a Demodulator Probe is essential. It will prove extremely useful in applications such as trouble shooting or aligning TV, RF, IF and video stages. Work in this frequency range requires demodulation of high frequency signals before Oscilloscope presentation. The Demodulator Probe Kit is supplied complete with the germanium diode, condensers, resistors, probe housing and shielded test lead along with a detailed assembly sheet.

1953 Main Catalog

Figure 5: #337-A Probe as shown in the main 1953 catalog. It was also listed in the 1953 summer flyer, and on both their order blanks.

ure 7. This is likely very close to the schematic for the #337-A. The two resistors reduce the peak RF voltage so it reads the RMS voltage correctly on the meter. The #337-B uses a 56-2 crystal diode. Heathkit designated three interchangeable diodes to the 56-2 part number: 1N34, 1N48 and CK-705.



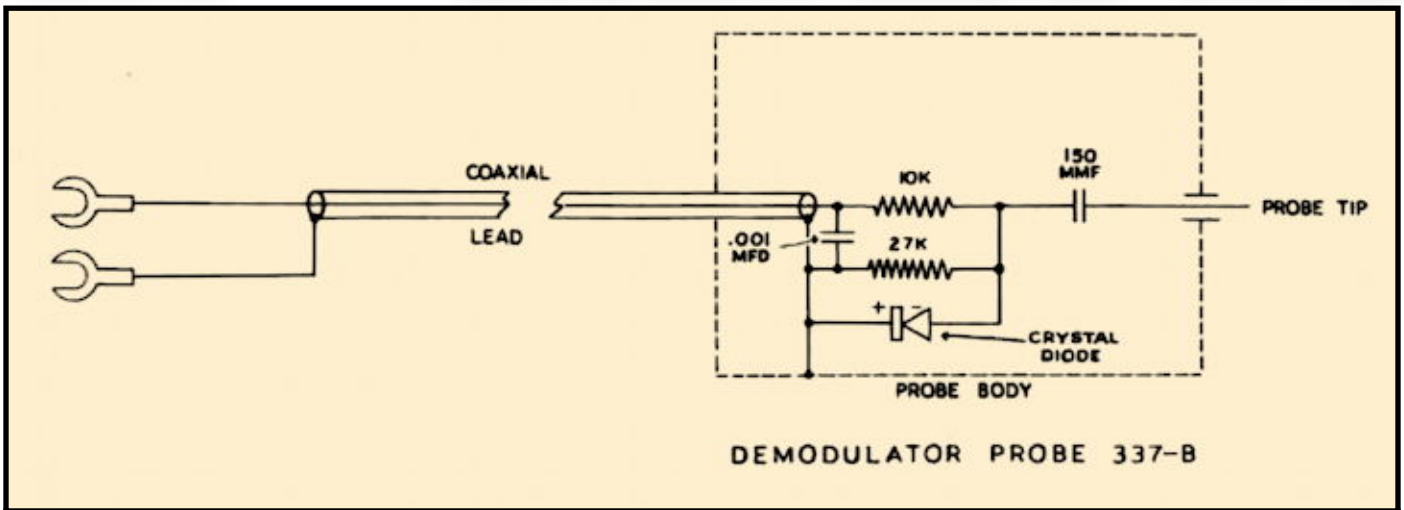


Figure 7: A schematic for the #337-B probe; The #337-C is identical except for the diode. The crystal diode is a 1N34, 1N48 or CK-705 (56-2) in the #337-B and an HD-2257A in the #337-C.

Inside the probe body is a small drilled board with holes that are used for tie-points for the five components. Leads are passed through a hole, twisted and soldered together and then trimmed to 1/4" and bent over to hold the connection in place. With its new probe housing the #337-B sold for \$3.50, a dollar less than the previous #337 models.

#337-C Demodulator Probe:

The #337-C appeared in late 1955. Like the #309-C ⁶ and 338-C ⁷, the major change was the phenolic board was replaced with a true printed circuit board. The only other change was the diode, which changed to an HD-2257 (56-4). The #337-C probe continued to sell for \$3.50 until 1968. It was listed in the Fall 1986

catalog, with a note stating it is "No Longer Available". It's last selling price was \$12.95.

T-3, T-4 and IT-12 Signal Tracer Probes:

While not a scope probe, this is a good place to mention the demodulator probes used on Heathkit signal tracers. These probes also demodulate, but, instead of being displayed on a scope, the detected signal is fed to an audio amplifier. The T-3 probe (**Figure 8**) is wired differently than the #337-C probe, as level correction and frequency response is not critical. The T-3 has two probes, one for audio and a demodulator probe for RF. An Amphenol 75-MC1F connector is used to connect to the T-3. The later T-4, and IT-12 (a restyled T-4) have a single probe that can be switched between au-

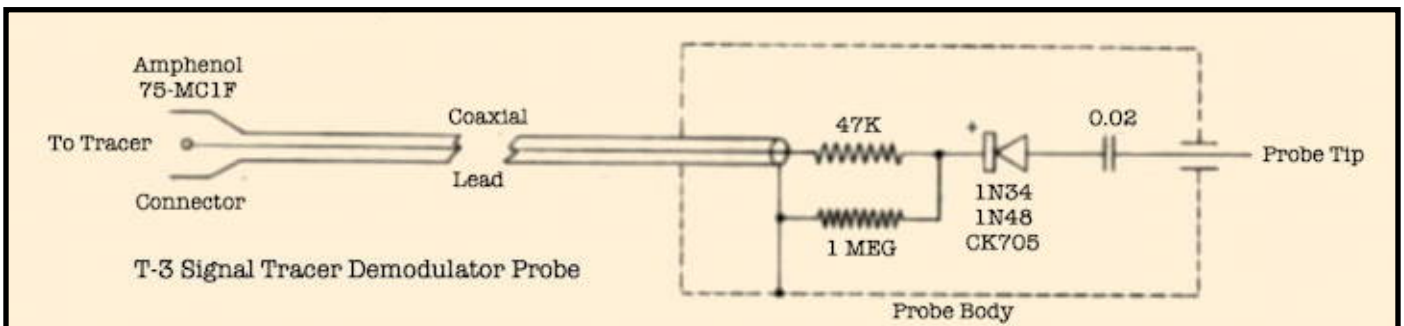


Figure 8: Schematic of the RF Demodulator Probe that came with the T-3 Signal Tracer.

dio and RF (Figure 9), and are hardwired to the chassis. These three probes use the “red - aluminum - black” style probe body.

#342 Low Capacity Probe:

In early 1953 the #342 Low Capacity Probe was introduced in the red - aluminum - black style probe-housing. Due to the need to mount a small trimmer capacitor in the probe housing, the larger diameter aluminum body provides the room and shielding for the simple circuit composed of the trimmer shunted by a resistor in series with the probe tip. Figure 10 shows the schematic and assembly drawing for the #342. Like the #337 it has spade-lug terminals for connection to a scope. This probe is designed to work with the scopes Heath was selling at the time, and provides approximately x10 attenuation with scopes having an input impedance of around 2.4 MΩ. It still works with other scopes providing isolation, though the attenuation will not be accurate. In the assembly sheet that came with the probe, Heath gives instructions on how to de-

termine the attenuation when used with instruments with other input impedances. Also, a note on the parts list states: *NOTE: When the Low Capacity Probe is used with instruments whose input impedance is not compatible with the circuit constants used,*

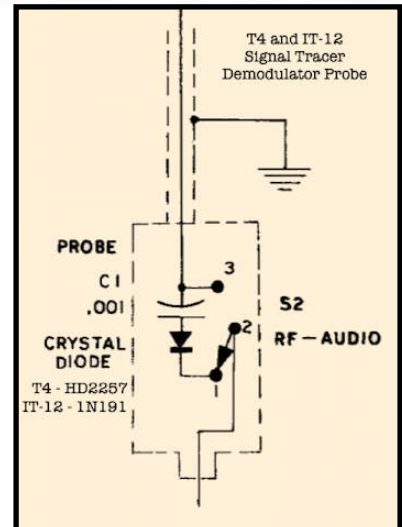


Figure 9: Schematic of the RF Demodulator Probe that came with the T-4 and IT-12 Signal Tracers.

there is no objection to altering the resistance value of 1-70. This note refers to the 22 MΩ resistor Heath part # 1-70. The #342 sold for \$3.50 until late 1959 when it was discontinued and replaced by the PK-1 probe. The #342 probe was introduced late enough that the “Red - Aluminum - Black” probe body was already in

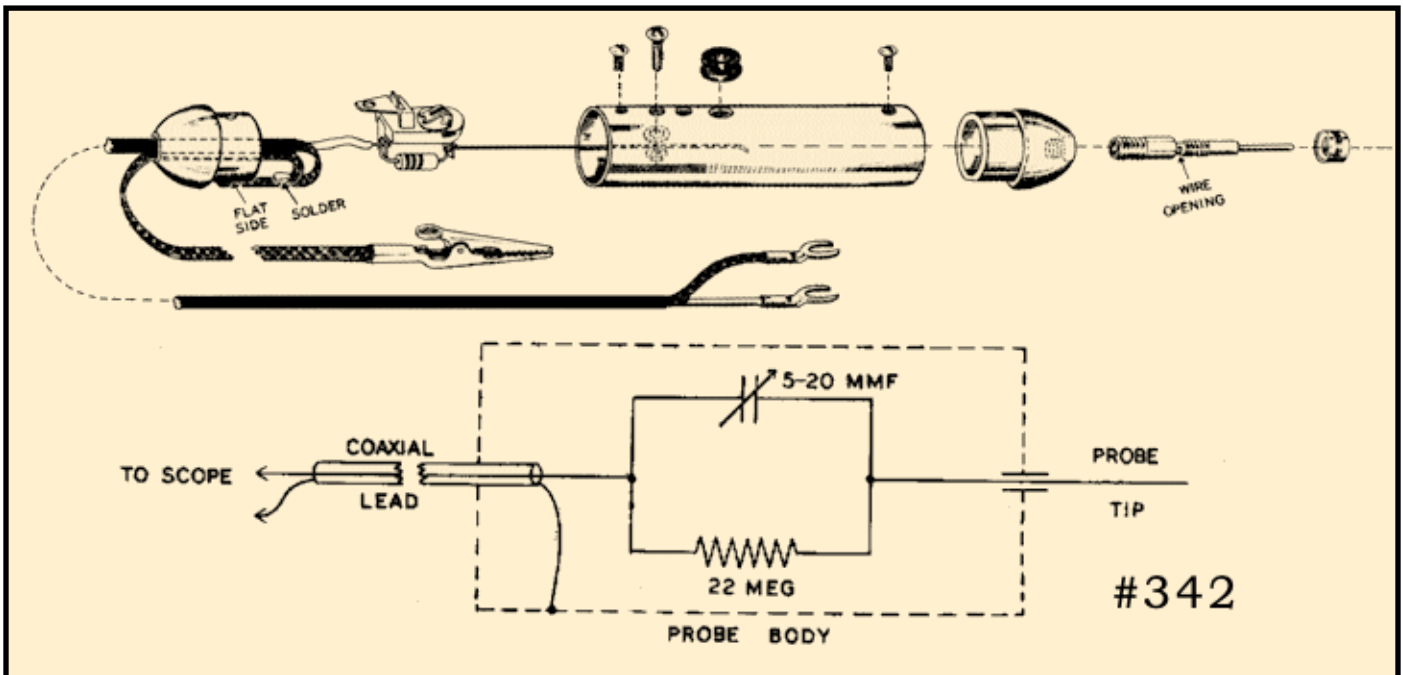


Figure 10: #342 Low Capacity Probe assembly drawing and schematic.

use, nor was a circuit board needed. hence there were no "B" or "C" versions. For a short overview of low capacity probes see the sidebar. "LOW CAPACITANCE PROBES".

PK-1 Universal Oscilloscope Probe:

The PK-1 was introduced in late 1959 for \$4.95. It is a probe that is switchable between an x1 regular probe and x10 low capacitance probe. Switching is performed by a slide switch that mounts inside the aluminum probe housing. Also housed inside is the trimmer capacitor and two resistors. The PK-1 schematic is shown in **Figure 11**. Resistors are provided to wire the probe for scopes with 3.6 MΩ and 1 MΩ input impedances. The PK-1 was the last probe scope or VTVM probe to be offered in kit form. The PK-1 sold for over 30 years. In the Winter 1991 catalog the probe was selling for \$17.95.

PKW-2 Oscilloscope Probe:

The PKW-2 was released in 1968 specifically for use with the IO-14 "Professional" Scope.

Low Capacitance Scope Probe . . .
Factory Assembled

PKW-2 PROBE MINIMIZES CIRCUIT LOADING & SIGNAL DISTORTION . . . designed for scopes with 1 megohm input, such as Heathkit IO-14. Features miniature switch for x1 or x10 attenuation. Impedance in x1 position is 1 meg shunted by 110 pF . . . 10 meg shunted by 20 pF in x10 position. Response is DC to 25 MHz. Max. DC voltage is 600 V. Features spring-loaded clip tip for hands-free operation.
 Wired PKW-2, 1 lb. \$12.00

PKW-2
\$12⁰⁰



Catalog 810/69 - 1969

Figure 12: PKW-2 x1 / x10 switchable probe with UHF connector was designed to work with the IO-14 "Professional" oscilloscope with an input impedance of 1 MΩ shunted by 15 μf.

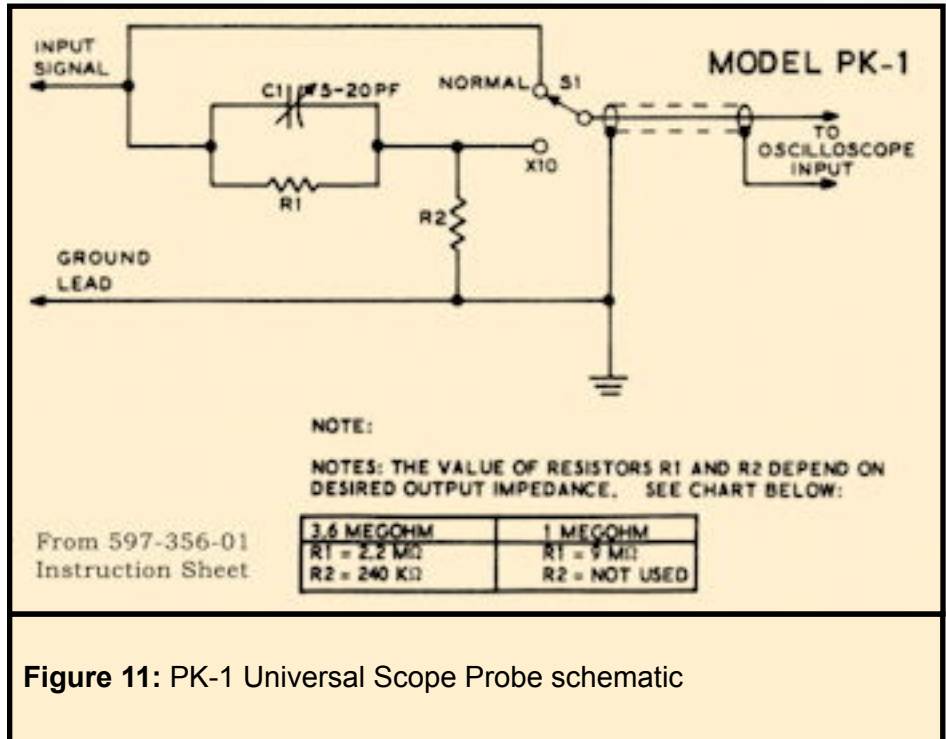
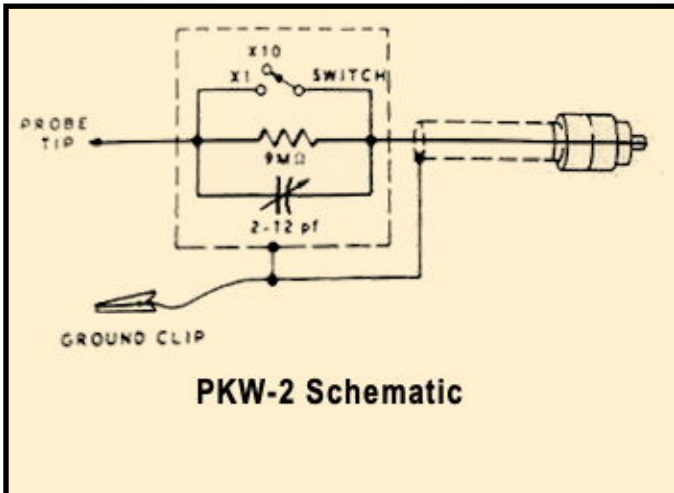


Figure 11: PK-1 Universal Scope Probe schematic

It is factory assembled, switchable between x1 and x10 and terminates in a UHF PL-259 connector. The IO-14 is the only scope the author is aware of made by Heath that uses that connector. The catalog ad gives the specifications for the PKW-2 (**Figure 12**). The probe was last offered in 1971, and remained selling for \$12.00. **Figure 13** shows the schematic for the PKW-2.

PKW-101 Oscilloscope Probe:

The PKW-101 factory assembled scope probe, shown in **Figure 1**, was introduced in the 1971 catalog (810/71) alongside the new EU-70A Solid State oscilloscope ⁸. It is a 10x only probe. The new probe matches the 1 MΩ input resistance of the EU-70A. One megohm was quickly becoming a standard scope input impedance in the mid-seventies. Up to then the older Heathkit scopes had a typical input resistance in a range between about 2 and 4 megohms.



PKW-2 Schematic

Figure 13: PKW-2 factory wired probe schematic. The resistor is 9 MΩ the capacitor is 2–12 pf.

Many varied with the setting of the input attenuator. Most, if not all, of the oscilloscopes Heathkit developed after 1971 standardized on an input impedance of 1 MΩ⁹ shunted by a capacitance around 35 - 45 μf¹⁰. The PK-101 looks very similar to scope probes of the seventies. It is likely that Heath used a commercially manufactured probe or assembled the probes from parts procured through another probe manufacturer? The PK-101 sold for \$19.95 when it was introduced, and it was selling for \$27.95 in late 1976 when it was discontinued.

The PKW-101-1 Probe Accessory Pack...

“...consists of the most commonly lost or damaged parts of the PK-101. Includes three assembled tips, two 6-inch ground leads and one 12-inch ground lead. PK-101-1 mailable

..... 9.95”
 is how the accessory pack was described in the 1975 Christmas catalog. The pack also supports the PKW-104 introduced in 1975. the PKW-101-1 continued to be sold until 1979, more than two years after the PKW-101 and PKW-104 it supported were replaced by the PKW-105. In the Christmas 1978 catalog the price was dropped to \$5.95, evidently a close-out price.

LOW CAPACITANCE PROBES

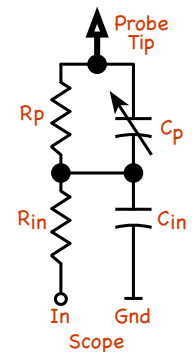
In order to inflict minimum disruption on a circuit under measurement, the test probe should present high resistance and low capacitance. For a DC circuit added resistance is adequate. This resistance attenuates the voltage being measured. Typically an attenuation of x10 provides good isolation. To get x10 the resistance in the probe should be nine times the input resistance of the scope. This works well at DC, but as soon as the frequency being measured is about a few hundred Hertz the AC attenuation is no longer x10. To correct this a capacitive voltage divider needs to be added to the probe. For this to be realized the capacitance across the probe resistor must be one-ninth the capacitance of the scope input, including the capacitance of the probe test lead. Low capacitance shielded wire is used with the probe to keep the capacitance across the probe resistor as small as possible. The capacitor across the probe resistor is made variable by using a trimmer capacitor. There are various ways to adjust the capacitor, one being looking at a square wave and adjusting the trace for the best square wave.

The schematic shows a typical low capacitance probe. The two equations show the required probe component values to work correctly where:

- R_p is the probe resistor;
- R_{in} is the scope input resistance;
- C_p is the probe capacitor;
- C_{in} is the scope input capacitance, including the test lead capacitance;
- n is the desired attenuation.

$$R_p = (n - 1)R_{in}$$

$$C_p = \frac{C_{in}}{n - 1}$$



PKW-104 Oscilloscope & Counter Probe

“The PKW-104 is a derivative of the PKW-101. It is a direct 1:1 probe and is designed to be used with counters as well as oscilloscopes when measuring low-impedance

sources. Like the PKW-101 it comes factory assembled. The frequency response in a low impedance circuit is above 17 MHz. The PKW-104 is also supported by the PKW-101-1 Accessory Pack. The PKW-104 was introduced around 1975. It remained for sale until the PKW-105 replaced it and the PKW-101 in the fall of 1977.

PKW-105 Oscilloscope Probe:

The PKW-105 dual purpose (x1 / x10 switchable), factory assembled, probe is listed as new in the Fall 1977 catalog (#817) for \$24.95. This same probe was also sold by Gould, Pomona, Zenith, AP and other companies under their own brand name. It was a very popular probe at the time. The actual manufacturer is unknown. The Heathkit probe instructions are marked "Made in England". None of the other brands I've seen give



Figure 14: Heath PKW-105 factory wired probe instruction book and accessories.

a country. They all come with the identical instruction sheets, except for the branding. However, in the specifications "meters" is spelled in the British fashion as "metres" on all the spec sheets seen.

The probe has a three position switch that selects **x1**, **Ref**, **x10**. The Ref position connects the probe tip to ground through a 9 MΩ resistor and connects the output to the scope directly to ground. This allows the user to see the trace location at zero input. **TABLE II** gives the specifications for the PKW-105.

| Heath Zenith PKW-105 Scope Probe Specs: | |
|---|--------------------------------------|
| Position x1 | |
| Bandwidth: | D.C. to 10 MHz |
| Input Resistance: | 1 M Ω* |
| Input Capacity: | 40 pF + Plus o'scope capacity |
| Working Voltage: | 600 Volts D.C. (Including peak A.C.) |
| Position Ref. | |
| Probe tip grounded via 9 MΩ resistor, o'scope input grounded. | |
| Position x10 | |
| Bandwidth: | D.C to 100 MHz |
| Risetime: | 3.5 nanoseconds |
| Input Resistance: | 10 MΩ ± 1%* |
| Input Capacity: | 11.5 pF* |
| Compensation Range: | 10 – pF |
| Working Voltage: | 600 Volts D.C. (Including peak A.C.) |
| Supplied Accessories: | |
| Insulating Tip | I.C. Adapter |
| Sprung Hook | BNC Adapter |
| Trimmer Tool | |
| * Value for an o'scope with 1 MΩ 30 pF input. | |

TABLE II

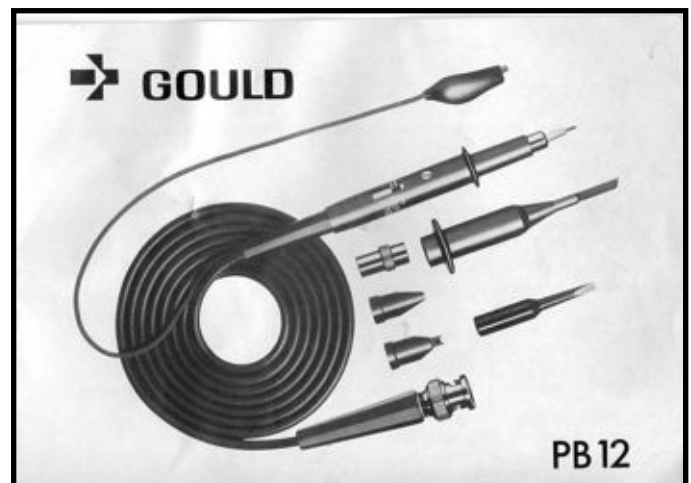


Figure 15: Gould PB12. similar to the Heathkit PKW-105 probe.

IOA-3220 Oscilloscope Probes:

In the fall of 1985 the price of a single PKW-105 had risen to \$32.95. In that catalog Heath first offered two PKW-105 Probes with a pouch for \$59.95 under the part # IOA-3220. When the Christmas catalog came out the prices had increased to \$34.95 and \$64.95. And when they were discontinued in the summer of 1990, the prices had reached \$37.95 and \$69.95.

P-250-2 Oscilloscope Probe Set:

The P-250-2, a two probe set, was introduced in the Spring 1988 catalog at a price of \$99.95. It is switchable x1 or x10 with a bandwidth of 250 MHz at x10. The P-250-2 continued to sell at the same price at least through the Winter 1991 catalog was not offered in the March 1992 catalog.

P-350-2 Oscilloscope Probe Set:

The P-350-2, a two probe set, was introduced along side the P-250-2 probe set in the Spring 1988 catalog. The X10 only probe has a bandwidth of 350 MHz. It initially sold for \$139.95. By the fall of 1989 the price dropped

to \$99.95, and in the Christmas catalog it dropped another \$20 to \$79.95. It remained at that price in the Winter 1991 catalog but was not offered in the March 1992 catalog.

One may wonder why the 350 MHz probes were eventually selling for less than the 250 MHz probes? The 350 MHz probe has only the x10 function so a switching mechanism isn't needed. An additional possible reason was the sales volume for the 350 MHz probes was higher.

P-150 (PS-150) Oscilloscope Probes:

In The Summer 1990 catalog (Volume #221) the PKW-105 and IOA-3220 were replaced with the new P-150 (\$37.95) and PS-150 two probe set (\$69.95). Like their predecessors, they are switchable between x1 and x10. The bandwidth of these new probes is 150 MHz when used in x10. These probes continued to be sold by Heath Educational Systems and appear in their 1993 catalog #270.

Ramblings:

Over the years I've owned numerous scope

CAT. 211 Spring 1988

NEW

250 MHz scope probes

A set of two modular X10 probes, switchable X1/X10, with a bandwidth of 250 MHz. Packaged with accessory tips.

Assembled P-250-2
Ship wt. 1 lb. \$99.95

NEW

350 MHz scope probes

A set of two modular X10 probes with a bandwidth of 350 MHz. Packaged with a full complement of accessory tips.

Assembled P-350-2
Ship wt. 1 lb. \$139.95

Figure 16: In the Spring 1988 Catalog #211 Heathkit introduced two high bandwidth probe sets to complement the PKW-105 / IOA-3220-1 probe(s) that have a 100 MHz bandwidth.

Heathkit R. F.
P R O B E

Figure 17: With some kits Heath supplied a sheet of 4 decals (390-13) to place on the aluminum probe body. The decal for the 309-C and PK-3(A) is shown above. Decals for the Low-Capacity probe, Scope Demodulator probe and Peak - to - Peak probe are also included on the sheet.

probes, none of them Heathkit. In 1980 when I bought a Heathkit IO-4235, then Heath's top of the line 35 MHz scope, I knew I'd need a pair of good scope probes. A friend sold me a pair of Gould PB-12 probes that worked well, so I didn't order the then recommended PKW-105 probes. Little did I know they were the same probe, and they worked fine with the scope.

Over the past half-decade I picked up a Heathkit PKW-101 and two PK-1 probes. The PKW-101 is currently with my Sony Tektronix 323 portable scope. The two PK-1 probes are awaiting an IO-18 to be restored.

Until next time, keep well my friends.

73, from AF6C



Notes:

1. CRT TVs before today's LCD flat screen digital TVs.
2. The IO-14 (IOW-14 factory wired) was one of the first Heath scopes to adopt the trending standard of a 1 MΩ input resistance.
3. No copy of this sheet has been found yet.
4. This, and the fact that none of the other probes of the time had an 'A' revision (they all went directly to a 'B' revision), let people to believe the 'A' was just a typo. Not so!
5. See last month's HotM (#118) Figure 4.
6. Ibid. Page 3 (page 11 in RF)
7. Ibid. Page 6 (page 14 in RF)
8. In the 1972 catalog 800-28 Heathkit announced a kit version of the factory wired EU-70A (\$565.00), the kit was given the model number IO-105 (\$399.95).
9. The 1 MΩ input resistance refers to the Vertical Input. The Horizontal input may be different.
10. the input capacitance varied between scopes due to lead length and dressing. The capacitance was in a range that could be compensated for by the probe adjustment capacitor.
11. A "4mm shielded plug" is evidently a banana plug, though I wonder if they meant insulated instead of shielded. This test lead set may have come from Europe.
12. A "sprung hook" is a spring loaded hook on the probe tip that may be clipped onto a terminal. wire or other point in a circuit, usually before applying power so the measurement may be made hands-free and eliminate the damaged should a hand-held test probe slip and short something out.

Notes for HotM #119 (VTVM Probes) 10/2023

Remember if you are getting rid of any old Heathkit Manuals or Catalogs, please pass them along to me for my research.

This article is copyright 2023, and originally appeared in the October issue of 'RF', the newsletter of the Orange County Amateur Radio Club - W6ZE.

Thanks - AF6C

REVISION NOTES:

NEW (Nov 20, 2023):

CHANGES FROM ARTICLE as published in October RF:

Page 10: Paragraph removed:

“PKW-200 Versatile Test Lead Set”:

This paragraph originally appeared in **Part II** of the article as printed in RF September 2023 Newsletter. In the HotM versions it was removed from **Part II** and placed in **Part I** since it related more to VTVMs and meters than oscilloscopes.