Instructions

for the

HEATH ZENITH

170 Hz PRESELECTOR CIRCUIT BOARD ACCESSORY

Model HDA-3030-4

Table Of Contents

HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022

597-3271-01

INTRODUCTION

The 170 Hz Preselector Circuit Board Accessory, Model HDA-3030-4, consists of four very stable, high Q, low gain stages of two-pole active bandpass filters. It provides a bandpass of 170 Hz to aid in removing strong adjacent channel signals. The circuit board plugs easily into the HD-3030 Terminal Interface with no required circuit modifications.

PARTS LIST

Remove the parts from the 170 Hz Preselector Circuit Board pack and check each part against the following list. Do not remove components that are supplied on a tape from the tape until you use them in a step. Return any part that is in an individual envelope back into the envelope after you have identified it until that part is called for in a step. Do not throw away any packing material until you account for all the parts.

To order a replacement part, always include the PART NUMBER. Use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, refer to "Replacement Parts" inside the rear cover of this Manual. For prices, refer to the separate "Heath Parts Price List."

TAPED COMPONENTS

Refer to the enclosed "Taped Component Chart" and follow the instructions at the top of that chart to check the components. The taped parts are in assembly sequence. It is not necessary to check them against the Parts List.

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.

RESISTORS

All 5% resistors have four color bands (last band gold). The last band (gold) will not be called out.

All resistors are 1/4-watt.

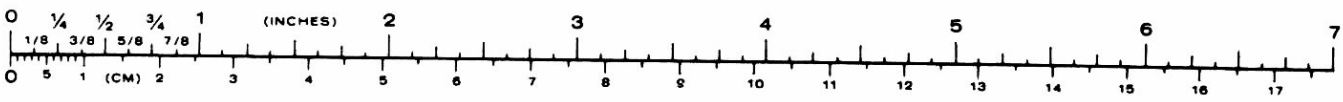
6-221-12	4	220 Ω (red-red-brn)	R2, R5, R8, R11
6-623-12	1	62 kΩ (blu-red-org)	R1
6-104-12	3	100 kΩ (brn-blk-yel)	R4, R7, R10
6-364-12	2	360 kΩ (org-blu-yel)	R3, R9
6-394-12	2	390 kΩ (org-wht-yel)	R6, R12

NON-TAPED COMPONENTS

The following parts are not taped on strips. The key numbers correspond to the numbers on the "Parts Pictorial" (Illustration Booklet, Page 1).

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
CAPACITORS				
A1	21-176	2	.01 µF ceramic	C9, C10
A2	27-227	8	.005 µF Mylar	C1 – C8
INTEGRATED CIRCUIT				
NOTE: Integrated circuits may be marked for identification in any one of the following four ways: 1. Part number. 2. Type number. (This refers only to the numbers and letters shown in **BOLD** print in the Parts List. Disregard any other numbers or letters shown on the IC.) 3. Part number and type number. 4. Part number with a type number other than the one shown.				
B1	442-21	2	**MC1458**	IC1, IC2

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
MISCELLANEOUS				
C1	10-1102	4	500 Ω control	P1, P2, P3, P4
	85-2864-1	1	Preselector circuit board	
C2	432-1111	1	5-hole right angle socket	
C3	432-1023	1	10-hole right angle socket	
C4	432-1039	1	15-pin plug	
C5	434-230	2	8-pin IC socket	
	344-70	12"	Violet wire	
C6		1	Blue and white label	
	597-260	1	Parts Order Form	
	597-3379	1	Taped Component Chart	
		1	Instruction Booklet (see front page for part number)	
			Solder	



STEP-BY-STEP ASSEMBLY

Refer to the components on the "Taped Components Chart" before you begin. The components are in assembly sequence.

Refer to Pictorial 1 (Illustration Booklet, Page 1) and install the following components.

( ) R1: 62 kΩ (blu-red-org).

( ) R2: 220 Ω (red-red-brn).

( ) R3: 360 kΩ (org-blu-yel).

( ) R4: 100 kΩ (brn-blk-yel).

( ) R5: 220 Ω (red-red-brn).

( ) R6: 390 kΩ (org-wht-yel).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R7: 100 kΩ (brn-blk-yel).

( ) R8: 220 Ω (red-red-brn).

( ) R9: 360 kΩ (org-blu-yel).

( ) R10: 100 kΩ (brn-blk-yel).

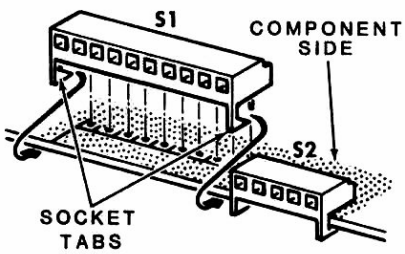
( ) R11: 220 Ω (red-red-brn).

( ) R12: 390 kΩ (org-wht-yel).

( ) Solder the leads to the foil and cut off the excess lead lengths.

Refer to Pictorial 2 (Illustration Booklet, Page 1) for the following steps.

( ) Install a 10-hole right angle connector at S1 from the component side of the circuit board.

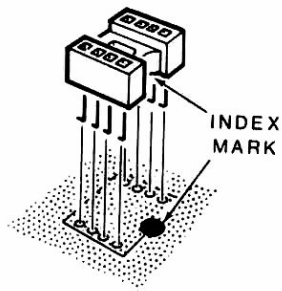


( ) Install a 5-hole right angle connector at S2.

( ) Solder the 15 socket pins to the foil.

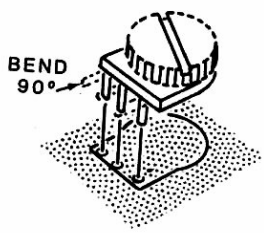
Install two 8-pin IC sockets as follows. Make sure you match the socket identification mark on each socket with the index mark on the circuit board. Solder the pins to the foil after you install each socket.

( ) IC1.
( ) IC2.



Bend the leads of the following 500 Ω controls 90°. Then install the 500 Ω controls as follows. Keep the controls flat against the circuit board. Solder the pins to the foil and cut off the excess pin lengths.

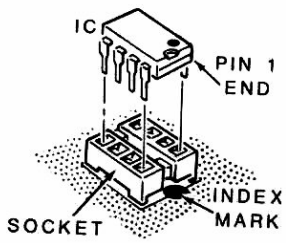
( ) P1.
( ) P2.
( ) P3.
( ) P4.



Install two MC1458 ICs (#442-21) as follows. Remember to position the pin 1 end as shown.

( ) IC1.

( ) IC2.



Refer to Pictorial 3 (Illustration Booklet, Page 1) for the following steps.

Install two .01 µF ceramic capacitors as follows:

( ) C9.
( ) C10.

Install eight .005 µF Mylar capacitors as follows:

( ) C1.
( ) C2.
( ) C3.
( ) C4.
( ) C5.
( ) C6.
( ) C7.
( ) C8.

( ) Solder the leads to the foil and cut off the excess lead lengths.

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board for the following problems.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

( ) Protruding leads which could touch together.

( ) Check the ICs for proper installation.

This completes the circuit board assembly. Proceed to "Installation and Alignment."

INSTALLATION AND ALIGNMENT

NOTE: If you are assembling this accessory along with the HD-3030 Terminal, skip the following cabinet disassembly steps.

Refer to Pictorial 4 (Illustration Booklet, Page 2) for the following step.

( ) Remove the cabinet top and bottom from the HD-3030 Terminal Interface and set them aside.

> WARNING: In the following steps, when power is applied to your unit, take all precautions to keep your hands away from the "High Voltage Areas" shown in Pictorial 5 (Illustration Booklet, Page 3). THE VOLTAGES IN THESE AREAS ARE POTENTIALLY LETHAL.

Refer to Pictorial 5 (Illustration Booklet, Page 3) for the following steps.

( ) Remove the circuit board support from the chassis and set it and the hardware aside.

( ) Install the 15-pin plug on the main circuit board of the Terminal Interface at location PRESELECTOR. Insert the shorter plug pins into the circuit board holes and solder them to the foil. Keep the plug body tight against the circuit board.

( ) Mount the Preselector Circuit Board over the 15-hole plug as shown. Make sure to insert the circuit board socket over all the plug pins.

PRESELECTOR ALIGNMENT

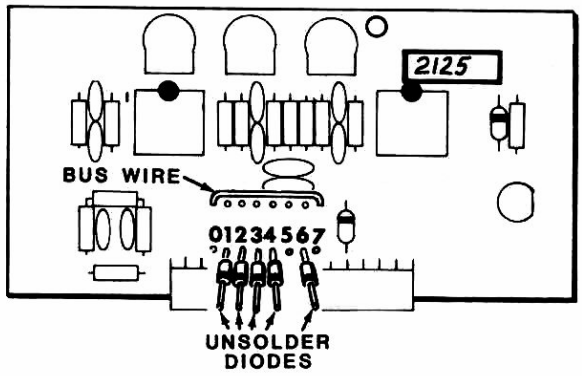
Refer to Pictorial 6 (Illustration Booklet, Page 4) for the following steps.

You can align the Preselector most easily and accurately with a calibrated audio frequency signal generator. However, if one is not available, you can obtain the needed frequencies from the AFSK circuit by installing jumpers across certain diodes positions on the 2125 Hz filter board. If you do not have an accurate signal generator, continue with the following "AFSK Signal Source". Otherwise, proceed to "Signal Generator Source" on Page 10.

AFSK Signal Source

( ) Bend a 1" length of wire (a cutoff component lead will do) into a "U" shape and insert the ends of the wire into pins 12 and 13 of the I/O connector on the rear panel as shown in the inset drawing.

( ) Remove the 2125 Hz filter board from the HD-3030 Terminal Interface.



Detail 6A

( ) Refer to Detail 6A and unsolder the indicated diode leads that are soldered to the bus wire. Lift the end of the diodes away from the bus wire and from the other leads.

( ) Cut seven 1" lengths of violet wire and remove 1/4" of insulation from each end.

( ) Refer to Part 1 of Detail 6B and turn the circuit board foil side up. Then "tack solder" one end of each violet wire to the indicated foil pads for diodes 0 through 6 as shown.

The following chart shows the jumpers that must be connected to produce the various frequencies that are required for the alignment. For example, to obtain a frequency output of 2495 Hz, connect the free end of the jumper wires at 1, 2, 4, 5, and 6 as shown in the chart.

FREQUENCY OUTPUT	JUMPER # 0	1	2	3	4	5	6
2495 Hz		x	x		x	x	x
1979 Hz		x			x		x
2310 Hz	x	x		x		x	x
2100 Hz			x	x	x		x

NOTE: After you connect the jumpers for a desired frequency, reinstall the board over its main circuit board plug and make the adjustment described under "Control Adjustments." Then remove the board and connect the appropriate jumpers for the next frequency. Repeat this until all the controls are adjusted.

( ) 2495 Hz – Refer to Part 2 of Detail 6B and connect jumpers at 1, 2, 4, 5, and 6.

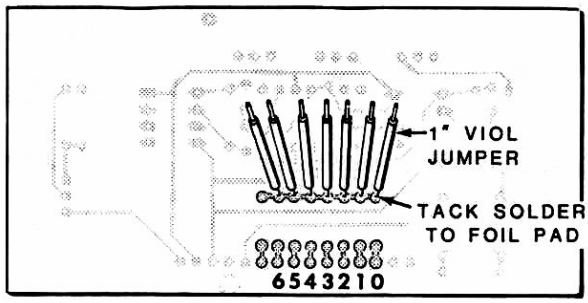
( ) 1979 Hz – Refer to Part 3 of Detail 6B and unsolder jumpers 2 and 5 (the ends last soldered).

( ) 2310 Hz – Refer to Part 4 of Detail 6B and unsolder jumper 4. Then solder jumpers 0, 3, and 5.

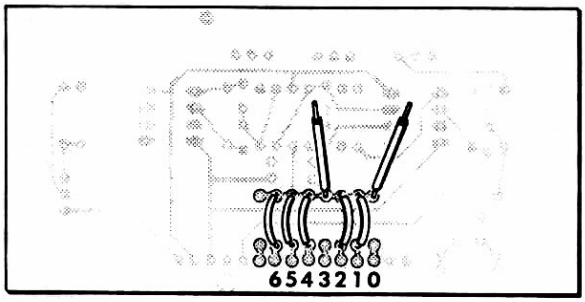
( ) 2100 Hz – Refer to Part 5 of Detail 6B and unsolder jumpers 0, 1, and 5. Then solder jumpers 2 and 4.

If you used the AFSK as a signal source, skip the "Signal Generator Source" section that follows and proceed to "Control Adjustments".

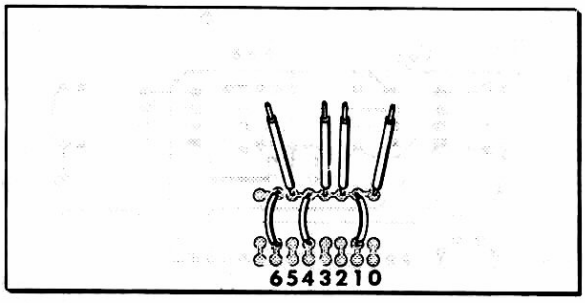
PART 1



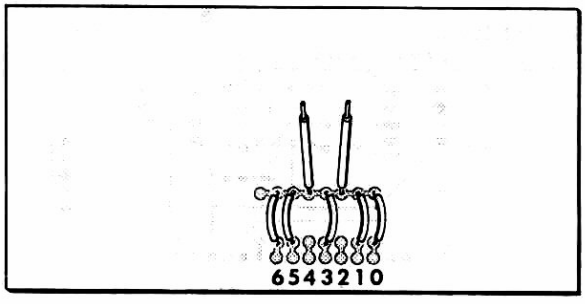
PART 2
2495 Hz



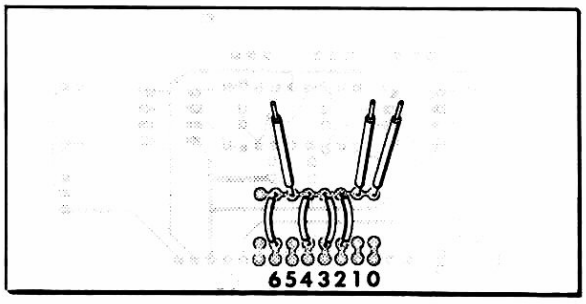
PART 3
1979 Hz



PART 4
2310 Hz



PART 5
2100 Hz



Detail 6B

Signal Generator Source

Refer to Pictorial 7 (Illustration Booklet, Page 5) for the following steps.

Your audio frequency signal generator should be accurate to within ± 5 Hz for proper operation of the filter.

( ) Connect the signal generator signal lead to pin 13 of the I/O connector on the back panel. Then connect the shield lead to the chassis.

( ) Connect the signal generator line cord plug to an AC receptacle and place its power switch in the On position.

Control Adjustments

( ) Set the four trimmer controls on the Preselector Board to the centers of their rotation.

( ) Connect the line cord plug to an AC receptacle and press the Power pushbutton in (on).

( ) Press in the Preselect, Send, and 170 Hz pushbuttons.

( ) Connect an AC voltmeter (or an oscilloscope) to TP on the 170 Hz Preselector Circuit Board.

( ) If you are using a signal generator, set its frequency at 2495 Hz and its output for a .5 to 1 volt indication. If you are using the AFSK signal source, make sure the wiring is for 2495 Hz and adjust the AFSK output for a .2 volt indication.

( ) Carefully adjust control P1 for a peak output reading.

NOTE: As you make the adjustments, reduce the output of the signal source to keep the output reading between .5 and 1 volt.

For the remainder of these adjustments, you will either set your signal generator to the indicated frequency or, for the AFSK source, return to Page 8 and change the jumpers as instructed. Then perform the adjustment as directed.

( ) 1979 Hz – Adjust P2 for a peak reading.

( ) 2310 Hz – Adjust P3 for a peak reading.

( ) 2100 Hz – Adjust P4 for a peak reading.

( ) Disconnect your meter or oscilloscope and your signal generator or the jumper from the I/O connector.

( ) If you used the AFSK source for alignment, remove the 2125 Hz circuit board and remove both ends of all seven jumper wires that you installed. Then reconnect the free ends of the diodes to the bus wire and replace the board.

( ) Remove the backing paper from the blue and white label and press the label onto the side of the HD-3030 chassis.

This completes the alignment of your Preselector. If you are installing the "Universal 425/850 Hz Filter" in your Terminal Interface, proceed to that Manual; otherwise, proceed with the following steps.

Refer back to Pictorials 4 and 5 (Illustration Booklet, Pages 2 and 3) for the following steps.

( ) Position the circuit board support bracket over the top rear corners of the circuit boards and align the bracket slots with the holes in the chassis sides. Secure the bracket with two 6-32 × 1/4" screws.

( ) Mount the cabinet bottom and cabinet top to the chassis with four 6-32 × 1/4" flat head screws.

This completes the "Installation and Alignment." If you are assembling the HA-3030 Terminal with this Accessory, return to "Operation" in that Manual at this time, or, you may finish reading the information in this Manual first.

OPERATION

The 170 Hz Preselector provides a narrow bandpass filter for 170 Hz shift operation. It is intended for 170 Hz shift RTTY operation. The center frequency is not compatible with the CW demodulator. The filter bandwidth allows reliable operation up to 150 baud ASCII, and begins to impair at 300 baud ASCII. To activate this filter, press the 170 pushbutton so it remains in and an orange flag appears in the pushbutton window. This places the filter in series with the HD-3030 Terminal Interface limiter circuit.

CIRCUIT DESCRIPTION

Refer to the Schematic Diagram (Illustration Booklet, Page 6) while you read this "Circuit Description."

The 170 Hz Preselector consists of four stages of two-pole active filters. Resistor R1 is the input resistor for the first stage at IC1A. The subsequent stages, consisting of IC1B, IC2A, IC2B and their associated components, are cascoded to provide a very stable high Q narrow bandpass filter for the 170 Hz shift RTTY operation. Each filter stage is independently tuned with a variable control at P1, P2, P3, and P4 to assure the narrow bandpass.

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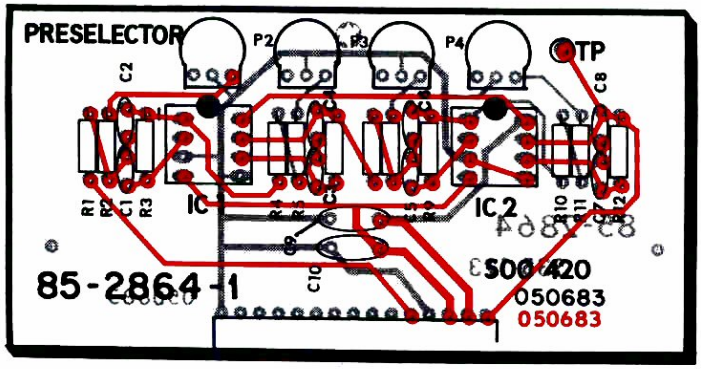
CIRCUIT BOARD X-RAY VIEW

NOTE: To find the PART NUMBER of a component for the purpose of ordering a replacement part:

A. Find the circuit component number (R5, C3, etc.) on the "X-Ray View."

B. Locate this same number in the "Circuit Component Number" column of the "Parts List."

C. Adjacent to the circuit component number, you will find the PART NUMBER and DESCRIPTION which must be supplied when you order a replacement part.



**(Shown from the component side.
The foil on the component side is shown in red).**

SERVICE INFORMATION

The following Heath Company services are available if you need them: Replacement Parts, Technical Consultation, and Factory Service. Address all correspondence to:

HEATH COMPANY
Benton Harbor, Michigan 49022

For prompt service, use a seperate letter for each department you write to.

Replacement parts and carry in repair service are also available at your nearest Heathkit Electronic Center. These Centers are listed in your Heath Catalogs.

REPLACEMENT PARTS

If a replacement part is needed, use the warranty parts order form or a letter including the following information.

1. Part number and description.
2. Model Number of the equipment.

If your equipment is in the Warranty period, add:

3. Date, location and invoice number of purchase.
4. Nature of defect.

Heath Company will fill your order promptly. Save but DO NOT RETURN PARTS unless they are requested. Parts that are damaged through carelessness or misuse by the customer are not replaced without cost.

TECHNICAL CONSULTATION

You can write or call our Technical Consultants for help with any Heath equipment, or for answers to any questions about the use of this equipment.

The completeness and accuracy of the advice mailed back to you depends entirely on the information in your letter. Be sure to include:

1. The Model Number and Series Number of the equipment (on blue and white identification label).
2. Date of purchase.
3. An exact description of the difficulty. Include switch positions, connections to other units, operating procedures, voltage readings, and any other information you think might be helpful.
4. List everything you have done in attempting to correct the difficulty.

FACTORY SERVICE

If you do not have qualified repair services at your disposal, you can return your equipment to the Heath Company Service Department to have it repaired for a minimum service fee. (Equipment that has been modified will not be accepted for repair.) Refer to Shipping Instructions for details on how to package and ship the equipment.

To be eligible for replacement parts under the terms of the Warranty, equipment returned for factory service must be accompanied by the invoice or the sales slip, or a copy of either. (If you send the original invoice or sales slip, it will be returned to you.)

SHIPPING INSTRUCTIONS

Check the equipment to see that all parts are in place. Then, wrap the equipment in heavy paper. Place the equipment in a strong carton, and put at least three inches of resilient packing material (shredded paper, excelsior, etc.) on all sides between the equipment and the carton.

Seal the carton with gummed paper tape. Ship it by prepaid UPS or insured Parcel Post to:

HEATH COMPANY
SERVICE DEPARTMENT
Benton Harbor, Michigan 49022

Include a letter, containing the following information:

1. Your name and return address.
2. Date of purchase.
3. Complete description of the difficulty.
4. Your authorization to ship the repaired unit back to you C.O.D. for the service and shipping charges, plus the cost of parts not covered by the Warranty.

YOUR HEATH FACTORY ASSEMBLED PRODUCT ONE-YEAR LIMITED WARRANTY

Welcome to the Heath family. We believe you will be pleased with the performance of your new Heath assembled product. Please read this consumer protection plan carefully. It is a "LIMITED WARRANTY" as defined in the U.S. Consumer Product Warranty and Federal Trade Comission Improvement Act. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

HEATH'S RESPONSIBILITY

PARTS — Replacement for factory defective parts will be supplied free for one year from date of purchase. Replacement parts are warranted for the remaining portion of the original warranty period. You can obtain warranty parts direct from Heath Company by writing or telephoning us at (616)982-3571. And we will pay the shipping charges to get those parts to you...anywhere in the world.

SERVICE LABOR — For a period of one year from the date of purchase, any malfunction caused by factory defective parts or workmanship will be corrected at no charge to you. You must deliver the unit at your expense to the Heath factory, any Heathkit Electronic Center (units of Veritechnology Electronics Corporation) or any of our authorized overseas distributors.

TECHNICAL CONSULTATION — You will receive free consultation on any problem you might encounter in the use of your Heath product. Just drop us a line or give us a call. Sorry, we cannot accept collect calls.

NOT COVERED — Repair service, adjustments and calibration due to misuse, abuse or negligence are not covered by this warranty. Unauthorized modification of the product or of any furnished component will void this warranty in its entirety. This warranty does not include reimbursement for inconvenience, installation, set-up time, loss of use, or unauthorized service.

This warranty covers only Heath factory assembled products and is not extended to other equipment and components that a customer uses in conjunction with our products.

SUCH REPAIR AND/OR PARTS REPLACEMENT SHALL BE THE SOLE REMEDY OF THE CUSTOMER AND THERE SHALL BE NO LIABILITY ON THE PART OF HEATH FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO ANY LOSS OF BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

OWNER'S RESPONSIBILITY

EFFECTIVE WARRANTY DATE — Warranty begins on the date of first consumer purchase. You must supply a copy of your proof of purchase when you request warranty service or parts.

OPERATING MANUAL — Read your operating instructions carefully so that you will fully understand the proper operation and function of your unit.

ACCESSORY EQUIPMENT — Performance malfunctions involving connections to (or interfacing with) other non-Heath equipment are not covered by this warranty and are the owner's responsibility.

SHIPPING UNITS — Follow the packing instructions published in your manual. Damage due to inadequate packing cannot be repaired under warranty.

If you are not satisfied with our service (warranty or otherwise) or our products, write directly to our Director of Customer Service, Heath Company, Benton Harbor MI 49022. He will make certain your problems receive immediate, personal attention.

The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.