Hapi 2

Kit Manual

Hegeman
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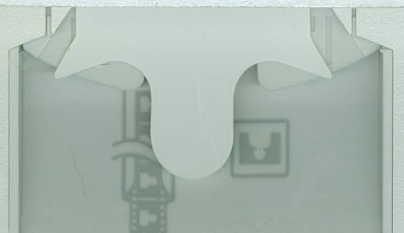
U.S.A.



INTRODUCTION

Kit building has been a tradition among electronics enthusiasts since the 1930's . A. Stewart Hegeman, designer of the Hapi 2 preamplifier, has helped to mold this tradition during the past forty years. His earlier creations have become classic collectors' pieces, and each has represented a significant advance in the art of sound reproduction. Under his guidance, kits by Lafayette, Harmon-Kardon, EICO and Dynaco became classics. In our present age of semiconductor technology, the "Citation" kit series by Harmon-Kardon is still remembered as one of the high points in audio design.

Stewart Hegeman's work has encompassed all aspects of audio, from recording techniques and tape recorder design, to amplifiers, advanced tuners and speakers, and the Hapi 2 is the crowning result of a life-long love affair with music and the science of sound. In its original production version, the Hapi 2 soon became the sonic standard of the Hi Fi world and proved once again that the "Old Master" still retains the magic touch. By offering the Hapi 2 in kit form, we welcome you to the very special circle of audio connoisseurs who can hear the difference that Hegeman products make.

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Hapi 2 Circuit Description

The input stage of the Hapi 2 Preamplifier is a fixed gain, low noise amplifier, having a flat frequency response and high input impedance. This allows the input impedance to be defined solely by the low noise 47 kilohm input resistor. Audio band noise caused by the RF interference is avoided by the use of a RF (radio frequency) filter adjacent to the input of the first amplifier.

Equalization is achieved by a purely passive circuit, isolated by the first flat amplifier and the flat response output amplifier. This approach assures maximum stability with optimum transient response, minimum phase shift and eliminates the need for separate buffer amplifiers. Each preamplifier board is adjusted for frequency response and gain balance by the insertion of trimming components at four possible points in the equalization circuit. An emitter follower isolates the gain stage from the control section and provides a very low source impedance to the following circuits.

The control section provides selection for phono input plus three high level inputs, gain and balance controls, mode selection, loudness compensation and low-cut filter. A tape monitor feature is available on input position #4.

High level inputs drive the low impedance and volume controls via an emitter follower. A flat gain stage with emitter follower output restores the insertion loss of the control circuits and provides sufficient gain to drive the power amplifier. Muting relays provide a 5 second delay on warm-up to prevent initial transient pulses passing through the power amplifier and causing speaker damage.

The Hapi 2 is powered by a unique tracking regulator supply which ties the positive and negative supply voltages to a single zener reference. This not only holds the supply to a stable voltage, but also assures the absolute symmetry in output and source impedance which is essential for balanced, distortionless and noisefree circuit operation.

TECHNICAL SPECIFICATIONS

Gain-phono	54db @1kHz
-high level	16db
Bandwidth	2Hz-350kHz.
Noise-phono	less than 3 microvolts referred to input-20kHz
-high level	100db below 6v output
Distortion	less than .03% harmonic or I.M.
Squarewave Rise time	0.5 microseconds@8v P.P output
Channel Separation	60db
Input Impedance	47k-36pf SHUNT
Output source impedance	15 ohms
Loudness contour	6db@100Hz 9o'clock position of volume control
Rumble filter	3db cut at 20Hz
Power Source	117v Ac 50-60Hz 220-230vAc 50-60Hz(special order)
Dimensions	1-3/4" x 19" x 9" relay rack mounting (HWD)
Convenience Outlets	1 switched, 1 unswitched (for auxiliary equipment)
Shipping Weight	5 lbs.

Hegeman Limited Warranty

Hegeman warrants to the original retail purchaser, this product to be free from defective material and workmanship when used in accordance with its printed instructions for a period of one (1) year in normal home use, from date of purchase. Hegeman agrees to remedy any such defect or to furnish a new part in exchange for any defective part of this unit, free of charge provided unit is delivered intact by the owner or his representative to Hegeman (prepaid) with proof of purchase for our examination.

If service is required:

1.) Contact Hegeman (address below) for authorization to return your unit for service. NO RETURNS WILL BE ACCEPTED WITHOUT PRIOR RETURN AUTHORIZATION.

2.) Hegeman is not responsible for shipping damage. If you do not have original packing, please request it when requesting the Return Authorization.

3.) All merchandise must be sent U.P.S., Prepaid and insured to Hegeman.
FOR RETURN AUTHORIZATION, WRITE TO:

Hegeman
9 Jules Lane
New Brunswick, New Jersey 08901
U.S.A.

4.) This warranty applies only to parts which are returned to the factory prepaid and are, in the sole judgement of Hegeman, defective under the terms of the warranty.

5.) This warranty is void if acid core solder or paste fluxes have been used during the construction of the kit. The warranty set forth above is in lieu of all other warranties, expressed or implied, of merchantability, fitness for purpose or otherwise. In no event shall we be liable for incidential or consequential damages or have any liability with respect to defects other than the obligations set forth above.

6.) Hegeman does not assume liability for damages or injuries incurred during the construction or operation of this kit.

The purchaser should complete the enclosed warranty card and mail it to Hegeman within 15 days after the purchase in order to register the warranty. Some states do not allow limitations on how long an implied warranty lasts, and/or the exclusion of limitation of incidential or consequential damages, so the above limitation or exclusions may not apply to you. This warranty gives you specific rights and you may also have other rights which vary from state to state.

Service Policy

If you have difficulties with this kit which cannot be resolved by your own efforts, write directly to us for advice. Address your correspondence to:

Hegeman
9 Jules Lane
New Brunswick, NJ 08901
U.S.A.

If it should become necessary to ship your unit directly to us for service, pack the unit carefully in the original carton if at all possible, if not, use a large well padded container. Ship PREPAID via United Parcel Service. Collect shipments will not be accepted.

Affix a label to the carton with your name and return address. A cover letter detailing symptoms, any steps you have taken to overcome the problem and a list of other components in your system should be enclosed.

Hegeman will inspect and service your kit at a minimum charge of $35.* plus the cost of any parts which may have been damaged due to improper handling, provided that the kit has been constructed and completed according to the instructions in this manual. This special service is available to you only during the limited warranty period, and applies only to completed units.

KITS WHICH SHOW USE OF ACID CORE SOLDER WILL NOT BE ACCEPTED.

*We reserve the right to make any changes in this policy without notice.

Unpacking

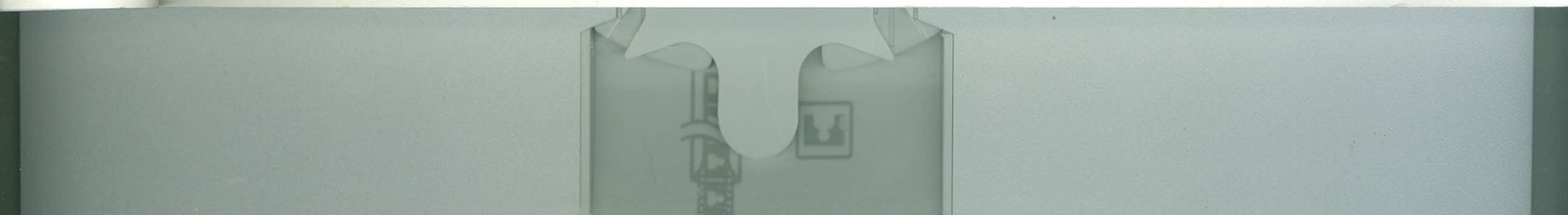
Allow ample room on your workbench to unpack the contents of this kit. Each major assembly is packed separately. Check each package against its parts list and carefully repack until required. If parts are missing check the contents of the carton and folds of the packing material. We suggest that you retain the packing material for later use in case of moving or warranty repair.

It may be necessary to make minor substitutions, in those cases, the components substituted will be equal or better than the original specifications.

PLEASE NOTIFY YOUR DEALER OR HEGEMAN IF YOU FIND A SHORTAGE OR AN INCORRECT PART. ALWAYS STATE THE MODEL AND SERIAL NUMBER IN YOUR CORRESPONDENCE.

In the unlikely event that damage has occured, immediately notify your dealer and request the name of the carrier so that a written claim to cover the damages can be initiated.

THE RIGHT TO ANY CLAIM AGAINST A PUBLIC CARRIER CAN BE FORFEITED IF THE CARRIER IS NOT NOTIFIED PROMPTLY AND IF THE SHIPPING CARTON AND PACKING MATERIALS ARE NOT AVAILABLE FOR INSPECTION BY THE CARRIER. SAVE ALL PACKING MATERIALS UNTIL THE CLAIM HAS BEEN SETTLED.



Parts List

17-054	1	Chassis cover
17-058	1	Chassis
17-061	1	Back panel
17-059	1	Front panel
19-007	4	Stick on feet
17-055	2	front mounting brackets
22-009	1	Preamp board
22-011	1	power supply board
22-010	1	main board
12-010	1	power switch
12-013	1	input switch
12-014	3	paddle switches
12-013	1	mode switch
06-001	1	balance control
06-002	1	volume control
17-057	1	5¼" bracket between PS & preamp boards
17-056	1	4" bracket for center of unit
17-054	1	3½" bracket for center of main board
19-042	4	3/8" lockwashers
19-043	3	3/8" flat washers
19-044	4	3/8" hex nuts
19-031	6	¼" 6-32 round head phillips head screws
19-023	29	#6 tooth lockwashers
19-022	16	#6 hex nuts ¼"
03-010	2	1.5k resistors
10-002	2	.47 caps loud switch
10-001	2	.22 caps to lo-cut
21-002	8	wire ties
19-039	6	½" hex spacers under boards
18-031	3	small knobs
18-032	1	large knob for volume control
19-005	8	#4 black sheet metal screws ¼"
19-006	10	6/32 x¼" black sheet metal screws

Parts List

18-017	1	ground binding post
18-028	1	single molded phono jack
18-029	3	double molded phono jacks
18-013	2	female AC convenience outlets
17-063	1	insulator
19-054	1	1/16" hex wrench

Hapi 2 Wire Lengths

wire color	totals	individual lengths in inches
red stranded (18 gauge)	2' 8"	~~9½~~, 9½, 8¼, 2½
red	3' 6 3/4"	2½, 14, 6½, 7 3/4", 11, 6,6
orange	1' 6½"	12, 6½
yellow	4' 1¼"	13, 4¼, 6½, 14½, 11
blue	2' 7 3/4"	13½, 4, 5½, 5½, 3¼
green	2' 3/4"	15, 5, 6
black	5' 5 3/4"	3, 5 3/4, 5,6, 14½, 10, 7 3/4, 3,11
gray	11"	~~11"~~ 5½, 5½
red/white	3' 1"	6, 2½, 15, 6½, ~~6~~
green/white	2' 1"	15, 5 3/4, 4
orange/white	1' 7"	12, 7½
yellow/white	2' 8 3/4"	13 4 3/4, 15
blue.white	2' 10¼"	13 3/4, 5½, 6, 6½, 2½
black/white	2' 3/4"	~~11~~, 4, 6½, 3¼, 6, 5
bare wire	1' 4 3/4"	2, 3½, 4¼, 1¼, 1¼, 4½

Hapi 2 Assembly Procedure

These instructions are presented in a series of simple steps, carefully designed to make the assembly and wiring of your Hapi 2 preamplifier as easy and pleasant as possible. Please read each instruction carefully before actually performing the work. Two spaces have been provided at the beginning of each step. Use the first space, headed "Assembly" to check off each step as it is completed. The second space, headed "Check" should be used when you go back over your work to check each stage as it is completed. We recommend that you recheck your work every ten or fifteen steps. Do not be in too great a hurry to complete your kit. Remember that many mistakes pass unnoticed because of tiredness.

Note that each part has been identified by a simple code. Eyelet or lug numbers are added to the code and where necessary, the particular lug is identified by the channel or section of the control or socket concerned. For instance, VCAR identifies the volume control, tab A, rear section; SB4 identifies the power supply board eyelet #4.

Three types of wire are used in the kit. Uninsulated, tinner copper wire is identified as "bare" wire, single strand hook-up wire is called out by color and stranded wire is called by color and type, e.g., "red-Stranded". Please note that most of the recommended wire lengths are slighlty longer than needed to make your connections. Trimming some lengths may be necessary for neat appearances.

The Hapi 2 preamplifier is assembled and wired as three separate units:

Front Panel
Chassis
Rear Panel

As each assembly is completed it should be checked and put aside until required. In this way, errors can be caught and corrected before the kit has been completed.

Abbreviations

In order to simplify the instructions, the following abbreviations will be used.

PS	Power Switch
IS	Input Switch
TS	Tape Switch
LC	Lo-Cut Switch
MS	Mode Switch
LD	Loud Switch
BC	Balance Control
VC	Volume Control
MB	Main Board
PB	Preamp board
SB	Power supply board
R	Rear
F	Front
b	Blue (wire)
gn	Green (wire)
br	Brown (wire)
y-w	Yellow/white (wire)
b-w	Blue/white (wire)
gn-w	Green/white (wire)
MO 1	Main Out 1
MO 2	Main Out 2
TO	Tape Out
TI	Tape Input
AI	Aux In
TU	Tuner In
PH	Phono In
HA	Head amp supply
SO	Switched Outlet
UO	Unswitched Outlet
O	Orange (wire)
Y	Yellow (wire)
r	Red (wire)
bk	Black (wire)
gy	Gray (wire)
o-w	Orange/white (wire)
r-w	Red/white (wire)
bk-w	Black/white (wire)
r18	red stranded 18 gauge wire
LH	left hand shield

Individual pins and eyelets are identified by number, following the component identification, e.g., SB4, MS3 etc.. Suffix A and B identify the channels where necessary.

Soldering Hints

The solder supplied with this kit is a high quality 60/40 tin-lead alloy with a resin core which has been specially formulated for use in electronic equipment. Make sure that the solder which you use in this kit is clearly labeled for use in electronic equipment. Corrosive, or acid core flux will quickly cause deterioration in performance, and its use will void the warranty given with this kit.

Use a high quality soldering iron with a fine tip; 35 watts will be sufficient. Always keep the tip clean, according to the manufacturer's instructions. An occasional wipe with a damp sponge will usually be sufficient to keep the tip bright.

Do not rely on a solder alone to give the joint strength. A good mechanical connection must be made before applying the solder. It is not necessary to tin the solid wire, but connections will be easier if the stranded wire is twisted and tinned before making the mechanical joint.

Apply the soldering iron directly to the joint and the solder exactly at the joint beneath the tip. In this way, the flux flows where it is needed. Never apply the solder to the side of the tip or on the face away from the joint. The solder will flow to the joint, but the flux will decompose before it can do its work of keeping the surface of the metal clean and free from oxides.

Be sure to use sufficient heat when making a connection. Too hot a tip oxidises the metal and causes a high resistance joint, and too cool a tip will melt the solder without a satisfactory bond taking place.

A good joint is shiny and appears as if it has been tapered or feathered into the metal surface. If the surface of the solder is grainy or dull and the wires look as if they have been pushed into a metal blob, resolder the connection. Do not blow on the joint to cool it quickly. If heat is a problem, conduct the excess heat away by holding the wire to be soldered with a pair of long nosed pliers.

When making a connection to an eyelet, allow 1/8" between the insulation and the top of the eyelet. This will allow clear space for the soldering iron to be applied without burning the insulation and will make inspection of the joint easier.

CAUTION: Do not apply heat for any extended period of time to any of the front panel controls while soldering.

Tools Required

Very few tools are required for the proper construction of this kit. You will need a pencil type soldering iron, 35 watts. Up to 60 watts could be used if care is taken not to overheat the soldered joints. You will also need a pair of long nose pliers, diagonal cutters, phillips screw driver and an adjustable wrench.

Preliminary Chassis Assembly

Place the chassis on the work surface with the bottom surface facing upwards.

Step	Assembly	Check	
1	( )	( )	Remove the backing from the four rubber feet. Mount the feet in the corners, approximately 1" from the front and rear edges and 1½" in from the sides.

Turn the chassis over and place it so that the open end with the flanges is away from you.

2	( )	( )	Mount the right hand board shield (3½"long) with the bracket facing to the left. Use #6 lockwashers between bracket and nuts. Tighten firmly.
3	( )	( )	Mount center (4"long) shield with bracket facing to the left. Use #6 lockwashers between bracket and nuts.
4	( )	( )	Mount left hand shield (5¼" long) with the bracket facing to the front. Use #6 lockwashers between the bracket and nuts.
5	( )	( )	Mount the 2 front panel brackets using 3 nuts and lockwashers per bracket. Make sure all brackets are tightened firmly.
6	( )	( )	Place paper insulater over each of the ½" studs (behind left hand bracket).
7	( )	( )	Screw hexagonal spacers to remaining 6, ¼" studs.
8	( )	( )	Mount main circuit board to right hand ~~studs~~ SPACER using #6 round phillips-head screws and lockwashers. Make sure that the relays are to the rear of the chassis.
9	( )	( )	Mount the pre-amp board on the two remaining hex spacers in the front of the chassis using #6 pan head screws and lockwashers. Make sure that the coils face towards the center of the chassis.
10	( )	( )	Mount the power supply board using #6 nuts and lockwashers. These should only be finger tight at this stage. The transformer is to the left of the chassis.

This completes the mechanical assembly of the chassis.

Front Panel Wiring

It is most convenient to wire the major components before mounting them to the front panel.

Input Switch

A four (4) position switch is provided. The center contacts are designated A,B, & C and the outer tabs are numbered clockwise (1,2,3, etc..) starting with the tab marked with Black. See figure (7)

Select the following wires and solder to the tabs specified on one of the selector switches. This will be the INPUT selector switch.

Step	Assembly	Check	Color	Length	Tab
1	( )	( )	Green/Wte	15¼"	B
	( )	( )	Green/Wte	5 3/4"	B
2	( )	( )	Red/Wte	6"	5
3	( )	( )	Orange/Wte	12"	4
4	( )	( )	Yellow/Wte	13"	3
5	( )	( )	Blue/Wte	13 3/4"	2
	( )	( )	Blue/Wte	5½"	2
6	( )	( )	Green	13 3/4"	A
	( )	( )	Green	5"	A
7	( )	( )	Red	6"	1
8	( )	( )	Orange	12"	12
9	( )	( )	Yellow	13"	11
10	( )	( )	Blue	13½"	10
	( )	( )	Blue	4"	10

Tags C,6,7,8 & 9 are not used.

11 Tie wires from ISB (green/wte, 15¼"), IS2 (blue/wte, 13 3/4"), IS3 (yellow/wte, 13") and IS4 (orange/wte, 12") using wire ties.

12 Tie wire from ISA (green, 13 3/4"), IS10 (blue, 13½"), IS11 (yellow, 13") and IS12, (orange, 12") using wire ties.

Mode Switch

Refer to Figure 4 for the MODE switch tab identification.
Tab 1 will be marked in black. All numbers will follow clockwise.

Step	Assembly	Check	Color	Length	From	To
1	( )	( )	bare	3/4"	A	B
2	( )	( )	bare	3/4"	C	11
3	( )	( )	bare	4¼"	8	¼" loops to 7, 7 to 6, 6 to 4.
4	( )	( )	bare	3½"	9	5,3,2 run wires as follows:

¼" deep loop parallel with the edge of the switch wafer to tab #5, between tabs B and 4, to 3, to tab 2 finish with no loop.

5	( )	( )	blue	5½"	5	--
6	( )	( )	blue/wte	6"	8	--
7	( )	( )	yellow	4¼"	A	--
8	( )	( )	yellow/wte	4 3/4"	11	--

Dress the plain wires outward, squaring off the loops with needle nosed pliers. Make sure that the connections made in each step are not touching.

Volume Control

The Hapi 2 uses a dual volume control, which is tapered to provide loudness compensation. The section nearest to the front panel is designated as the front section. The solder lugs are lettered as follows: A--ground, B--slider, C--signal input, D--tap. Refer to the diagram for the layout. Figure (1).

1	( )	( )	blue	5½"	C front	--
2	( )	( )	green	6 "	B front	--
3	( )	( )	black	5 3/4"	A front	--
			black	5"	A front	--

Step	Assembly	Check	Color	Length	From tab	To tab
4	( )	( )	blue/wte	6½"	C rear	--
5	( )	( )	green/wte	4"	B rear	--
6	( )	( )	black/wte	6½"	A rear	--
			black/wte	6"	A rear	--

The preliminary wiring of the front panel components is now complete.

Front Panel Mechanical Assembly

1	( )	( )	Snap 3 paddle switches (TAPE, LO-CUT, LOUD) into front panel.
2	( )	( )	Snap POWER switch into front panel.
3	( )	( )	Place 3/8" plain washer over threaded bushing of MODE switch.
4	( )	( )	Place 3/8" lock washer over threaded bushing of MODE switch and mount on front panel using 3/8" nut. Align the switch so that the blue wire (tab #5) is towards the LO-CUT switch.
5	( )	( )	Mount the BALANCE control, using lockwasher and 3/8" nut. The lockwasher goes between the front plate and the Balance control. Align the control so that the lugs face towards the LOUD switch.
6	( )	( )	Mount the INPUT switch temporarily, with tab A towards the TAPE switch. Use a lockwasher between the front panel and the input switch. Mount to the front panel using 3/8" hex nut. Do not tighten completely.
7	( )	( )	Mount VOLUME control temporarily, using a lock-washer and 3/8" hex nut. The lockwasher goes between the front panel and the VOLUME control. Align the control so that lugs D face towards the LOUD switch.

This completes the mechanical assembly of the front panel.

Loud Switch

The LOUD switch uses two 0.47 mfd. tantalum capacitors. Note that the negative lead is bonded directly to the case of the capacitor. Refer to the figure (2) for the switch tab numbering.

1	( )	( )	Trim leads of two 0.47 mfd. tantalum capacitors to ½" long and bend carefully at right angles to the case at 1/16" from the end of the capacitor, using needle nosed pliers.
2	( )	( )	Connect the negative of one capacitor to LD2 and the positive to LD1. Crimp connections but do not solder.
3	( )	( )	Connect the negative of the other 0.47 mfd. capacitor to LD5 and the positive to LD4. Crimp connections but do not solder.
4	( )	( )	Run the capacitors along the outside of the switch.

Lo-Cut Switch

The Lo-Cut Switch uses two 0.22 mfd. tantalum capacitors. Note that the negative lead is bonded directly to the case of the capacitor. Refer to the figure (5) for the switch tab numbering,

1	( )	( )	Trim leads of two 0.22 mfd. capacitors to ½" long and bend carefully at right angles to the case at 1/16" from the end of the capacitor, using needle nosed pliers.
2	( )	( )	Connect the negative of one capacitor to LC2 and the positive to LC1. Crimp connections but do not solder.
3	( )	( )	Connect the negative of the other 0.22 mfd. capacitor to LC5 and the positive to LC4. Crimp connections but do not solder.
4	( )	( )	Run the capacitors along the outside of the switch.

Front Panel Wiring

Locations marked with an asterisk (*) denote wires which have been previously connected. Dress the wires in steps 1 through 16 as shown in the main wiring diagram.

Step	Assembly	Check	Color	Length	From	To
1	( )	( )	blue	4"	IS10*	TS6
2	( )	( )	green	5"	ISA*	TS4
3	( )	( )	blue/wte	5½"	IS2*	TS3
4	( )	( )	green/wte	5 3/4"	ISB*	TS1
5	( )	( )	red	2½"	TS5	LC5 (solder both wires)
6	( )	( )	red/wte	2½"	TS2	LC2 (solder both wires)
7	( )	( )	orange	6½"	LC4	MB-8
8	( )	( )	orange/wte	7½"	LC1	MB-11
9	( )	( )	yellow	4 3/4"	MSA*	BC A front
10	( )	( )	blue	5½"	VC C front*	BC B front
11	( )	( )	black	5 3/4"	VC A front*	BC C front
12	( )	( )	black	3"	BC C front	LD 5
13	( )	( )	yellow/wte	4 3/4"	MS11*	BC C rear
14	( )	( )	blue/wte	6½"	VC C rear*	BC B rear
15	( )	( )	black/wte	6½"	VC A rear*	BC A rear
16	( )	( )	black/wte	5"	LD2	BC A rear

This completes the wiring of the front panel with the exception of the two 1.5 kilohm resistors and the power switch which will be added after the front panel has been attached to the chassis.

Rear Panel Mechanical Assembly

The rear panel is supplied with the line cord and the Head amp supply outlet pre-installed.

Step	Assembly	Check	
1	( )	( )	Mount 1 double pair molded phono jacks at MO1 and MO2 using 2 x #4 sheet metal screws.
2	( )	( )	Mount 1 single pair molded phono jacks at TO using 2 x 4# sheet metal screws.
3	( )	( )	Mount remaining 2 double pair molded phono jacks at ~~TI/AT~~ and TU/PH using 4 #4 sheet metal screws. TI/AI
4	( )	( )	Mount switched and unswitched convenience outlets.
5	( )	( )	Mount GND binding post using #6 lockwashers between nut and chassis.

This completes the rear panel preliminary mechanical assembly.

Rear Panel Wiring

Step	Assembly	Check	Color	Length	From	To
6	( )	( )	red	14"	HA3 (rear hole,tab)	MB-13
7	( )	( )	yellow	14"	HA2 (rear hole,tab)	MB-15
8	( )	( )	black	14"	HA1 (rear hole,tab)	MB-14
9	( )	( )	Use wire ties and run the above wires along rear panel,then run along the main board side of the center screen against chassis.			
10	( )	( )	Dress the following wires to run ½" away from edge of power supply board (SB). All connections to the circuit boards must be dressed to allow ¼" diameter loops to the edge of the board. The wire should be dressed straight down to the chassis where it is given a neat rectangle bend to lie along it.			
11	( )	( )	red	6"	HA3	SB 9
12	( )	( )	black	6"	HA1	SB-10
13	( )	( )	yellow	6½"	HA2	SB-7
14	( )	( )	bare	3½"	TOG	TIG to AIG to TUG

Start with one turn around TOG, solder, pass wire across to TIG, keeping wire straight. Continue with single turn around TIG, AIG, and TUG.

It is easiest to solder each ground pin as the wire is attached.

15	(✓)	( )	black	10"	MB-9	TUG
16	(✓)	( )	black	7 3/4"	PB-7	PHG
17	(✓)	( )	black/wte	6½"	PB-8	PHG
18	(✓)	( )	red/wte	6½"	PB-9	PHB
19	(✓)	( )	red	7 3/4"	PB-6	PHA
20	(✓)	( )	twist red and black wires evenly, 4 turns to form wire pair. Twist red/wte and black/wte evenly 4½" turns.			
21	( )	( )	black	3"	MB-4	MO2G
22	( )	( )	black/wte	3"	MB-5	MO1G
23	( )	( )	bare	1¼"	MO1A	MO2A
24	( )	( )	bare	1¼"	MO1B	MO2B
25	( )	( )	blue/wte	2½"	MB-6	MO1B
26	( )	( )	blue	2½"	MB-3	MO2A
27	( )	( )	yellow/wte	15"	MB-1	SB-3
28	( )	( )	red/wte	15"	MB-2	SB-4
29	( )	( )	Twist these wires evenly 9 turns. Run along rear of chassis next to rear panel.			
30	( )	( )	Use wire ties insert 3 wires, red, yellow, and black, each 11" long. Connect as follows:			
31	( )	( )	yellow	11"	SB6	PB1
32	( )	( )	black	11"	SB5	PB2
33	( )	( )	red	11"	SB8	PB3
34	( )	( )	Run wires along SB side of 5¼" LH shield, along LH end of PB against the chassis.			
35	( )	( )	grey	5½"	SO-B	SB1
36	( )	( )	grey	5½"	SO-A	SB2 under board
37	( )	( )	Loosen power supply board (SB), Trim wire ends under board so that there is no accidental short to chassis. Replace board and tighten nuts.			

This completes the wiring of the back plate.

Front Plate

Mount the front plate as follows:

1	( )	( )	Remove the nuts securing the Input switch and Volume control. The lockwashers remain on the shafts. Position Front plate, insert controls in brackets on chassis. The wires attached to the Input switch need a little extra care. Mount Front panel and tighten 3/8" nuts.			
2	( )	( )	green	6"	VCB front*	MB16
3	( )	( )	black	5"	VCA front*	MB17
4	( )	( )	black/wte	6"	VCA rear*	MB18
5	( )	( )	green/wte	4"	VCB rear*	MB19
6	( )	( )	blue/wte	6"	MS8*	MB12
			(this wire must be pushed back under MS and BC)			
7	( )	( )	blue	5½"	MS5*	MB7
8	( )	( )	red	6"	IS1*	PB4
9	( )	( )	red/wte	6"	IS5*	PB5
10	( )	( )	green/wte	15¼"	ISB*	TOB
11	( )	( )	blue/wte	13 3/4"	IS2*	TIB

12	( )	( )	yellow/wte	13"	IS3*	AIB
13	( )	( )	orange/wte	12"	IS4*	TUB
14	( )	( )	green	13 3/4"	ISA*	TOA
15	( )	( )	blue	13½"	IS10*	TIA
16	( )	( )	yellow	13"	IS11*	AIA
17	( )	( )	orange	12"	IS12*	TUA

Dress channel B connections along MB side of center shield, channel A connections along SB side of center shield. See diagram for detailed layout.

Power Supply Connections

When soldering stranded wire it is easier to twist the ends and tin them before inserting them into the soldering lugs.

18	( )	( )	red 18	2½"	SO2	UO2
19	( )	( )	red 18	8¼"	PS3	UO2
20	( )	( )	red 18	9½"	PS2	SO1
21	( )	( )	red 18	9 3/4"	PS1	UO1
22	( )	( )	resistor	1.5	LD1	VC D rear
23	( )	( )	resistor	1.5K	LD4	VC D front
24	( )	( )	Attach the rear panel wiring assemble to chassis using 6 - 6/32 x ¼ black screws.			

The resistors in steps 22 and 23 should be solder connected. This completes the Hapi 2 wiring. Check all connections, look for cold soldered joints, loose wire and stray pieces of solder. Make sure that the bare wire connections are not touching the chassis or other wires.

You are now ready to complete the construction:

1	( )	( )	Turn all controls to the maximum counter-clockwise position.
2	( )	( )	Mount large knob on volume control shaft with the index line level with the "V". Tighten.
3	( )	( )	Mount the Balance control knob so that the index line is level with the "B". Tighten.
4	( )	( )	Mount the Mode switch so that the index line is level with the "A" position. Tighten.
5	( )	( )	Mount the Input knob so that the index line is at the "P". Tighten.
6	( )	( )	Assemble the top cover using 4 # 6/32 x ¼" black screws. Note that the stiffening flange goes towards the front.

The contruction of your Hapi 2 preamplifier is now complete.

Testing and Trouble Shooting

Before putting your Hapi 2 in service, check your wiring for loose connections and make sure there are no bare wires touching metal parts.

All the circuit boards are tested thoroughly before shipment and it is rare that these cause trouble. Most problems we have encountered come from incorrect assembly. Complete lack of output usually points to a faulty connection in the power supply. Make sure that the fuse is still continuous and that the line connections are correct. Double check the connections to the power board.

If the fault is in one channel, the wiring is easily identified by channel. Most problems are solved by inspection of the wiring. Please refer to our service policy if you are unable to correct any problems.

HEGEMAN HAPI 2 KIT

OPERATIONS MANUAL

Section 1 Back Panel Connections

All rear panel input and output signal connections should be made with high quality co-axial audio cables (RCA phono type). Channel A corresponds to the left channel and Channel B to the right channel of the Hapi 2.

Whenever rear panel connections are being made the Hapi 2 and all associated components should be switched off!

Main Out 1 and Main Out 2

The Hapi 2 will drive any stereo or mono amplifier. Connect either main outs directly to the amplifier inputs. Channel A from the Hapi 2 to the left channel input of the amplifier and channel B from the Hapi 2 to the right channel input of the amplifier.

Tape out and Tape 4

The Hapi 2 provides you with a full tape circuit. To connect a tape deck or other component (equalizer signal processor) use the following procedure: the left and right outputs of the tape deck are connected by audio cables to the jacks on the back panel label TAPE 4 CHA A and CHA B. The left and right inputs of the tape deck are connected by audio cables to the jacks on the back panel labeled TAPE OUT CH A and CH B.

Aux 3

This high level input is provided for associated equipment such as a second tuner TV sound output, video recorder or a playback tape deck.

TUNER 2

Connect the cable from the left output of your tuner to tuner CH A input of the Hapi 2. Connect the cable from the right output of your tuner to tuner CH B input of the Hapi.

Phono P

Connect the cable from Channel A (left) of the turntable into Phono 1 CH A input jack. Connect the cable from channel B (right) of the turntable into phono 1 CH B input jack.

GND Ground

Under certain conditions it may be necessary to provide a common ground between the Hapi 2 and your associated equipment.

Headamp + 13v DC

This outlet is intended for use with future Hegeman accessory products.

SECTION 2 Front Panel Controls

Power

This high current power switch controls the power on the Hapi 2 and the switched AC outlets at the rear.

Input

This selector switch controls which input you wish to use.

Position P is used for the phono input.
Position 2 is used for the tuner input.
Position 3 is used for the aux input
Position 4 is used for the tape input.

Tape

This switch allows you to monitor the tape current.

Lo-Cut

This switch allows a system cutoff below 20Hz to accomodate warped records or any mechanical resonance of your phono playback system.

Mode

This switch controls channel switching.

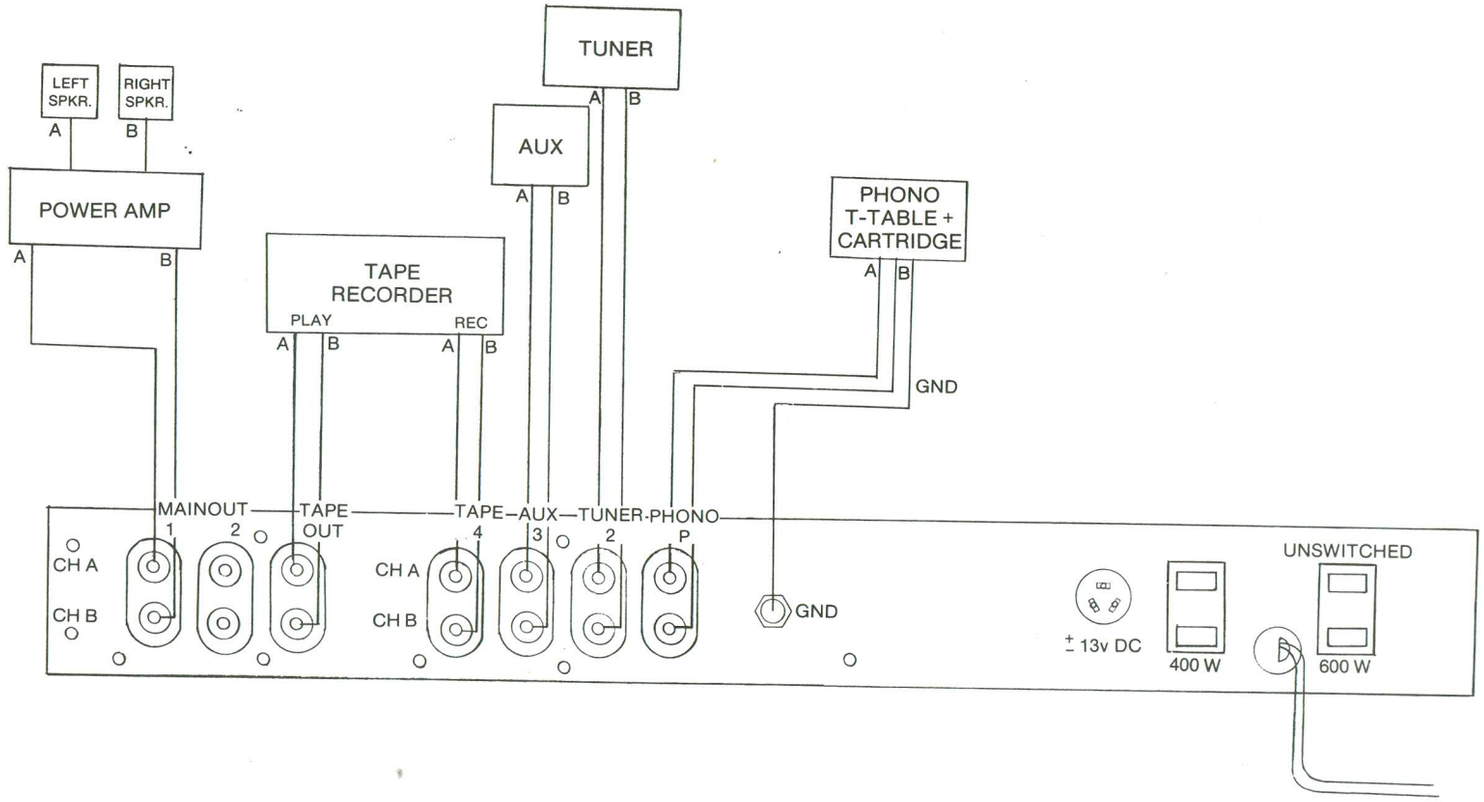
Position A- Signal from the left channel (CHA) is fed to both channels.
Position B- Signal from the right channel (CHB) is fed to both channels.
Position AB- Combines both inputs for a mono signal to both inputs.
Position ST- Stereo Signal.

Balance

The balance control adjusts for unequal volume levles between channels. Moving the controls to the left channel will reduce the volume of the right channel)CHB) while moving the control to the right will reduce the volume of the left channel (CHA).

Loud

The loudness circuit used at low listening levels adds a small amount of bass enhancement to preserve the balance of sound.


TUNER
A
B
LEFT SPKR.
RIGHT SPKR.
A
B
AUX
A
B
POWER AMP
A
B
TAPE RECORDER
PLAY
REC
A
B
A
B
PHONO T-TABLE + CARTRIDGE
A
B
GND
MAINOUT
1
2
TAPE OUT
TAPE
4
AUX
3
TUNER
2
PHONO
P
CH A
CH B
CH A
CH B
GND
± 13v DC
400 W
UNSWITCHED
600 W

Amendments and corrections to Hapi 2 Kit manual

PLEASE NOTE THE FOLLOWING UPDATES TO YOUR MANUAL BEFORE STARTING ASSEMBLY.

Page 10 - Hapi 2 Wire Lengths

wire color	totals	individual totals
red (18 gauge)	1'8¼"	9½, 8¼, 2½
gray	11"	5½, 5½
red/white	2'6"	6, 2½, 15, 6½
black/white	2'3/4"	6, 5, 4, 6½, 3¼

Notes*
Lengths supplied may be + or - 3/4"
For your convenience one extra strand of each color wire will be provided.

Page 15
Step 8, Line 1 - studs should read spacers

Page 16
Steps 1, 5, 6, and 10
Both wires in these steps will be soldered together on the same tab as listed.

Page 19
The second sentence should read:
"Note that the negative lead is bonded directly to the case of the capacitor."
This is the same for lo-cut switch instructions.

Page 20
Step 15 should read:

Color	Length	From	To
Black/wte	6½"	VC A rear*	BC A rear

Page 21
Step 3, Line 2 should read:
...jacks at TI/AI and...

Page 24
Steps 16 and 17
Asterisks should appear after IS11 and IS12.

Power Supply Connections

Before completing steps 18, 19, 20, and 21:
Connect AC power cord leads to the unswitched outlet on backpanel as per the master diagram #32-002. Do not solder these connections until after the wires in Steps 18, 19, 20, and 21 are connected.

Diagram Corrections

A. Last page of Hapi 2 Manual:
Tape Out (from Hapi 2) should go to tape recorder inputs or record jacks.
Tape recorder outputs or play should go to TAPE 4 on the Hapi 2.

B. On Diagram 32-001 Figure 6:
Tape switch initials should be TS NOT TI.