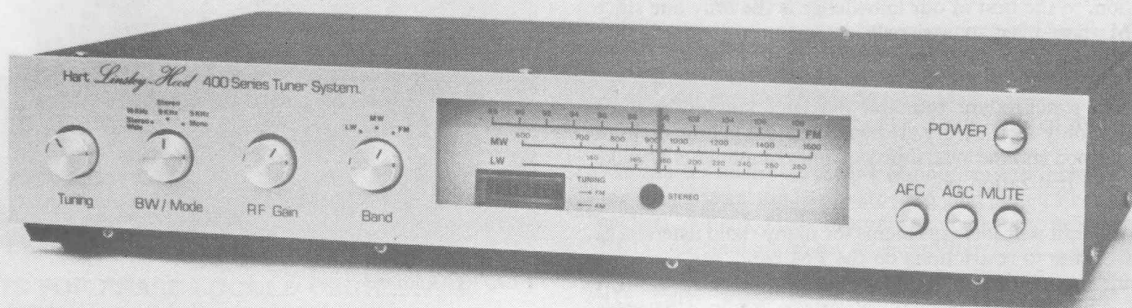


KITS & MODULES

400 SERIES LINSLEY-HOOD ULTRA HIGH QUALITY 'AUDIOPHILE' AM/FM TUNER SYSTEM



Temporary photo, new version has black front plate.

Complete Tuner.

This kit combines two of John Linsley-Hood's latest designs for separate AM and FM tuners to give a versatile receiver system which you can build to suit your own requirements with the separately optimised sections to give the ultimate reception quality possible from both broadcast media. The system can be built as a full feature AM/FM tuner straight away or started as an AM only or FM only initially, with the missing facility being added later.

The FM receiver section is the revolutionary PHASE LOCKED LOOP FM TUNER, described in a series of articles in 'Electronics Today International' (ETI). The combination of circuit features described give this unit a better performance at lower cost than current, ready made, commercial tuners. The complete kit thus offers the discerning audiophile the opportunity to obtain the superior audio quality he wants at a price far below that of comparable made-up equipment, with the added advantages of pride of ownership and lack of built-in obsolescence of a unit that you have assembled yourself.

The performance advantages come from radical thinking and re-appraisal of the two most important sections of any tuner, namely, the stereo decoder and the I.F./demodulator stages, which have both been greatly improved. The stereo decoder uses a sample and hold system to reconstruct the stereo signals, and this, allied to entirely separate signal paths and switching circuitry gives a much cleaner output with lower distortion than normal. In fact the total harmonic distortion, over the WHOLE audio range is less than 0.02% on both mono AND stereo. Due to the excellent design mono and stereo output levels are identical and the transition from mono to stereo is completely noiseless. This decoder may of course be used on its own as a retro fit to improve existing tuners whose own decoder performance may leave something to be desired.

The I.F./demodulator stage is also given the John Linsley Hood treatment with a 10.7Mhz phase locked oscillator being used to eliminate the detrimental effects of the frequency sensitive phase shifts present in any I.F. amplifier. Like the stereo decoder, which uses the standard MC/CA1310 to do the mundane quality independent work, the demodulator uses the CA3189/HA11225, but in a very much different way than the ordinary quadrature coil arrangement.

The difference in quality obtained with these circuits is quite staggering, for such is the clarity, transparency and extended frequency response, particularly at the bass end, that not only can differences between programmes be heard but also differences between *the same programme from a different transmitter!*

To match the high quality of the circuit design the engineering of this HART kit is similarly refined. The highly successful concept of 'minimal wiring' first used in our 300 Series amplifiers, is naturally retained, since it is of even greater value in maintaining consistent optimum performance at higher frequencies. This is allied to the master and sub board system as used in our Linsley Hood Cassette Recorder Kit to keep all sections of the circuitry separate, minimising interaction, and giving easily handled and easily built circuit blocks. A new HART concept that appears in the FM section of this kit for the first time is the 'Modular Building Block', in the shape of the power supply, which is a complete sub-assembly with everything, including the mains transformer and connection blocks for the mains input, all mounted on the board. This then fits on top of the master board protecting all points at mains potential.

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The type of components used in any audio equipment are very critical if ultimate quality is required. All components used in this receiver have been carefully chosen with the collaboration of the designer to give the best possible performance.

The AM receiver section is the John Linsley-Hood SYNCHRODYNE Ultra high quality long and medium wave tuner. This unit was described in 'Wireless World' magazine and represents a new and extremely novel approach to AM reception, to the best of our knowledge is the only one since pre-FM days ever to seriously attempt to obtain higher quality from this type of broadcast.

The basic synchrodyne principle has been known for some time, but only as a theory. It has taken the genius of John Linsley Hood and the availability of new components to make a practical realization possible.

This new unit will solve problems for many radio listeners as the BBC, due to restrictions on the FM band, are forced to transmit material really requiring better quality on the AM bands. This problem particularly affects Radio 4 listeners when the VHF channel is taken over for school broadcasts during most of the day. Radio three can also divide with summer sport broadcasts only on AM.

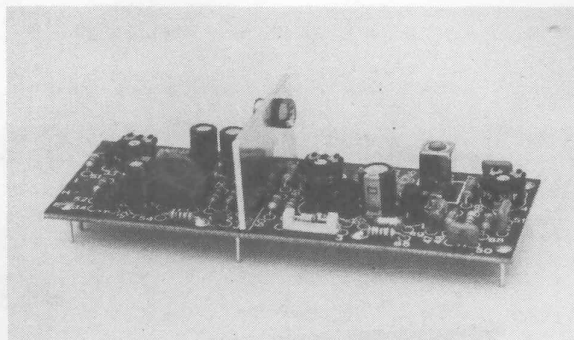
Particular care has been taken when designing the kit to make all presets and test points as accessible as possible and all components are of the highest quality and have been carefully chosen in collaboration with the Author to ensure a performance that is faithful to the original concept. All coils have been specially wound to the designers parameters for HART ELECTRONIC KITS LTD. As two rotary switches are needed, one for wavechange and one for bandwidth switching these have been used in our kit in a rather novel and advanced way, making it totally stable and as easy to assemble as possible. The easy option of wiring these switches conventionally to the PCB, whilst being entirely suitable for prototypes, was avoided as this would be tedious for the constructor and give inconsistent results. After much consideration a 'stacked' layout with three identical size PCBs has been evolved, with the switch wafers mounted directly on the boards to which they relate. These boards all have a 'Ground Plane' on the component side for total electrical and mechanical stability. The complete assembly consists of the three boards with a screening plate between the oscillator board and the mid section board, spaced apart on the two switch mechanisms. This very neat system leaves the tuning capacitor as the only part not on a board, but since this only involves two wires compared to the two dozen or so that would otherwise be needed for wiring the switches it is not too great a hardship.

Due to the novel design of this kit outlined above construction is very straightforward indeed. No test instruments, other than a multimeter, are required for setting up. We also offer an alignment service for the PLL/VCO board at a nominal charge.

This unbeatable combination of circuit designs by John Linsley Hood, high quality professional components and engineering by HART gives you a complete tuner which is a pleasure to build, a joy to listen to and will make you the envy of owners of over-priced commercial tuners of lesser capabilities.

STEREO FM TUNER SECTION.

PHASE LOCKED LOOP DEMODULATOR & VCO



PLL/VCO Board

420 Printed Circuit Board, double sided for screening and stability.....	£5.40
421 Resistor Set including Metal Film 1% types for low noise.....	£1.18
422 Capacitor Set. Best quality parts with dielectric as specified.....	£7.37
423 Semiconductors.....	£4.29
424 Hardware, including special mounting pins and IC Sockets.....	£2.45
426 Special Screening Can for complete PCB.....	£3.98

IF AMPLIFIER

430 PCB for 10.7MHz selective IF Amplifier.....	£3.85
435 Set of all other parts with 1% metal film resistors and matched sets of ceramic filters.....	£11.87

MUTE AMPLIFIER

440 PCB for mute circuit.....	£2.65
445 Set of all other parts, resistors, capacitors and hardware.....	£3.42

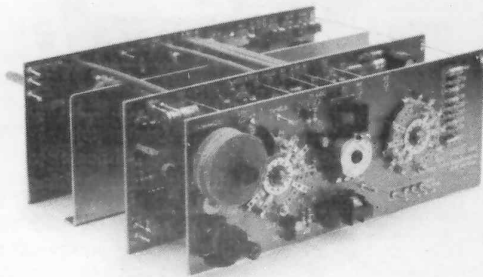
SAMPLE AND HOLD STEREO DECODER

490 Printed Circuit Board.....	£7.36
491 Resistor Set including Metal Film 1% types for low noise.....	£2.73
492 Capacitor Set. Best quality parts with dielectric as specified.....	£5.60
493 Semiconductors.....	£8.34
494 Hardware including board mounting sockets, IC holders & transistor pads.....	£1.30

RLH8 Reprints of 3 articles from Electronics Today International covering the FM tuner and stereo decoder... £2.70

INS400 Building Instruction Manual for FM section and assembly in metalwork..... £4.90

AM SYNCHRODYNE TUNER SECTION.



Complete Synchrondyne Assembly

PARTS FOR PHASE LOCKED OSCILLATOR SECTION.

- 450 Double sided PCB 184mm x 70mm fully drilled, all component locations marked with HART 'Visident' (Component identification still visible after assembly) system, fibreglass, roller tinned. £8.86
- 451 Set of Resistors, Metal film, carbon film as specified. £1.56
- 452 Capacitors as specified by the designer. £1.25
- 453 Semiconductors. £7.66
- 454 Hardware, including switch wafer, ready wound coils, test point pins and sockets for all ICs. £8.03

BOARD & PARTS FOR MID-SECTION.

This includes the detector, pass band filter amplifier, AGC and mute stage.

- 460 Double sided PCB 184mm x 70mm fully drilled, all component locations marked with HART 'Visident' system, fibreglass, roller tinned. £8.86
- 461 Set of Resistors, Metal/Carbon film. £2.23
- 462 Capacitors. £2.32
- 463 Semiconductors. £6.60
- 464 Hardware, with switch wafer, test point pins and sockets for all ICs. £1.98

PARTS FOR R.F. SECTION.

- 470 Double sided PCB 184mm x 70mm fully drilled, all component locations marked with HART 'Visident' system, fibreglass, roller tinned. £8.86
- 471 Set of Resistors, Metal film, carbon film as specified. 98p
- 472 Capacitors, fixed and trimmers. £1.29
- 473 Semiconductors. £2.07
- 474 Hardware for RF Section, including switch wafers, ready wound coils, test point pins and sockets for all ICs. £13.98
- 484 Hardware for complete synchrondyne assembly consisting of switch shaft & index mechanisms, screening plate, spacers etc. £9.82

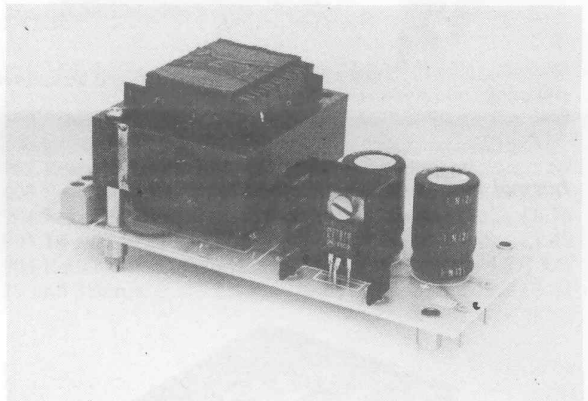
INS450 Building Instruction Manual for Synchrondyne AM Section. £2.90

RLH7 Reprints of The series of 3 articles in 'Wireless World' describing the design principles and circuits of the Synchrondyne A.M. Receiver. £2.60

(All literature is automatically included FREE with any complete kit.)

MASTER BOARD & PARTS USED IN ALL TUNER VERSIONS.

- 410 Double Sided Printed Circuit Board 200 x 244mm with green solder mask on component side to enhance ident legibility. This board is used as the basis for all versions of the tuner. £17.05
- 414 Hardware for Master board and Dial Assembly including tuning meter. £11.65
- 414A Dial Mounting Bracket. £3.68
- 414B Dial Scale. Self Adhesive, ready printed for LW, MW and FM Bands. 75p
- 416 Master board Parts for FM only version including resistors, capacitors and hardware with gold plated Phono output sockets, 3-bank push button switch, rotary switch, stereo LED and connectors for off-board items. £10.17
- 417 Master board Parts for AM only version. £5.09
- 418 Extra Parts to upgrade Set 416 to full AM/FM requirements. £6.66
- 419 Extra Parts to upgrade Set 417 to full AM/FM requirements. £11.73



15v Power Supply

1230/+15 COMPLETE POWER SUPPLY MODULE. 15v for FM only tuner. £13.18

1240/+20 COMPLETE POWER SUPPLY MODULE. 20v for AM & AM/FM tuners. £14.34

400M Metalwork with Chassis/Case, textured finish cover, front plate support bracket and backplate. £28.52

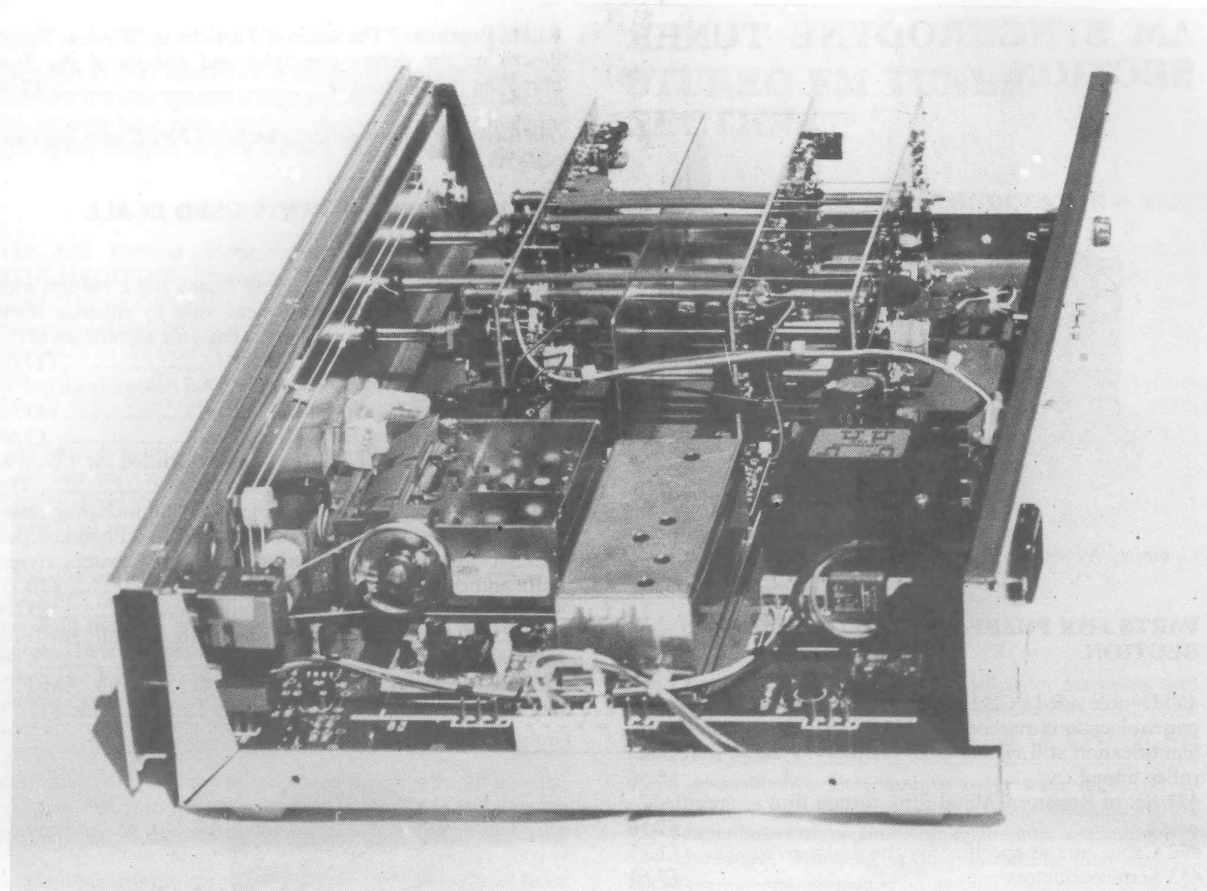
402 Front Plate. Aluminium extruded section, black anodised finish c/w window. £13.23

407 Set of collet fixing Knobs. £7.12

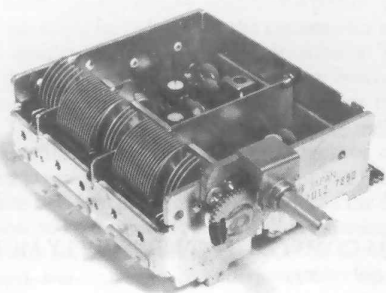
408 Metalwork Hardware. Including IEC mains socket. £5.80

409C Wire Kit for internal connections. £2.18

KITS & MODULES



Internal View with Stereo Decoder removed.



FF317 ALPS FM Tuner Head..... £13.68

C452 Optional Tuning Capacitor for use with synchrodyne if FF317 is not needed for FM. This must be free mounted by the user..... £3.80

U50 Mains Lead, 2 metres with moulded IEC and 13A plugs. £5.50

K400FM Kit for FM Only Tuner with 15v power supply. Total Cost of all required parts is £211.90

Our special discount price for the complete kit ONLY £169.52

Order as **K400FM FM Tuner Kit.**

K400AM Kit for AM Tuner. Total Cost of all required parts is £220.44

Our special discount price for the complete kit ONLY £176.35

Order as **K400AM AM Tuner Kit.**

K400FM/A Kit for FM Only Tuner with 20v power supply and all parts to adapt to AM/FM by simply adding the Synchrodyne AM Tuner Module. Total cost of all parts is £219.51

Our special discount price for the complete kit ONLY £175.61

Order as **K400FM/A Adaptable FM Tuner Kit.**

K400AM/FM Kit for Full AM/FM Tuner. Total Cost of all required parts is £311.36

Our special discount price for the complete kit ONLY £249.08

Order as **K400AM/FM Tuner Kit.**

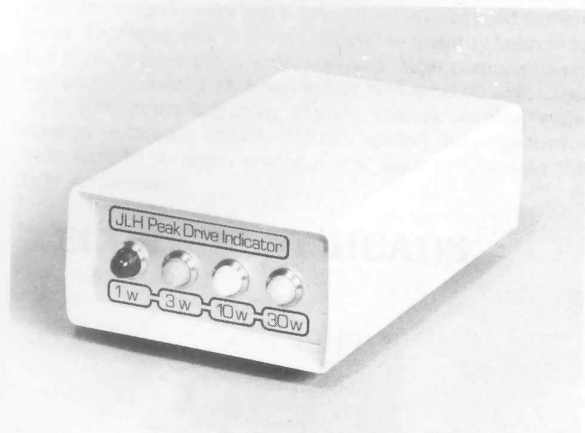
K450 Synchrodyne AM Tuner Module. Total Cost of all required parts is £91.85

Our special discount price for the complete kit ONLY £75.78

Order as **K450 Synchrodyne Module.**

KITS & MODULES

JOHN LINSLEY HOOD PEAK DRIVE INDICATOR KIT



This extremely useful device, originally described in 'Hi-Fi News and Record Review' is a very sensitive loudspeaker power monitor. It is designed to measure the peak voltage, and therefore power, going to a loudspeaker. The unit can be pre-set to detect 4 separate power levels, each of which will turn on an indicator lamp for 1 second, however short the peak exceeding the indicated power level. As it is capable of detecting peaks of only 5 microseconds duration not much gets past it without being spotted, and if a peak occurs exceeding the next preset power indication the previous light will be extinguished, to be replaced with the new higher level light.

The kit is supplied complete with all parts as described in the article including the plastic case with built in battery compartment, taking 4 pen cells which are not supplied. A reversible satin silver front plate has markings for 1, 3, 10 and 30 watts on one side and 3, 10, 30 and 70 watts on the other.

PDI Loudspeaker Power Monitor Kit..... £27.21
 RLH5 Reprint of original article..... £0.30

Sets of Parts for the LINSLEY HOOD 35/40 WATT CLASS A/AB MOSFET AMPLIFIER

We can supply components for this design, published in 'Electronics and Wireless World', March 1989. Prices are for parts for ONE channel.

- 1301 Set of Resistors, metal film, metal glaze, cermet or wirewound as specified..... £4.85
- 1302 Set of Capacitors as specified, standard set contains 2 x 4u7 for C8 giving a total of 9u4 in parallel..... £8.88
- 1302A Set of capacitors as above but with Low ESR electrolytics..... £15.46
- Extra for single 10u Axial in place of 2 x 4u7 Radial caps for C8..... £4.99
- 1303 Set of Semiconductors all as specified..... £25.41

As this amplifier is basically a simpler version of our new 80 watt power amplifier, published in 'Electronics Today International' May 1989 issue, the same advanced double sided PCB can probably be used. Some adaptation and linking will be required of course but since amplifiers are so layout critical it is better to start with a proven board. See the section covering our 80 watt amplifier for prices.

Sets of Parts for the LINSLEY HOOD QUALITY A.M. RADIO

This unusual version of a conventional superheterodyne circuit uses careful design techniques with modern components and a very novel low-distortion detector to re-create, and maybe surpass, the quality of sound available from the vintage years of A.M. valve radios.

The detector system uses two ultra low noise dual op-amps to provide a precision full wave A.C. rectifier, eliminating the high distortion dead band at the crossover point of a normal diode detector. Even the IF stages have been implemented in a new way using dual-gate mosfets and two IF coils per stage to give a neatly optimised bandpass characteristic.

It may be thought that the A.M. bands have been superseded now by F.M. but due to the vagaries of programme planning this is now less true than ever, as anyone stuck with an F.M. only tuner wanting to listen to Radio 4 during the day will testify. Even at dead of night the excellent BBC World Service is, perhaps logically in this case, only available on the AM bands. This unit will therefore fulfil a long felt need for those who wish to listen to these 'orphaned' programmes with the best quality that is possible.

Described in 'Wireless World' magazine October 1986, brief details and circuits are given to enable anyone with some knowledge of radio layouts to make an A.M. Tuner, or a complete 3 watt radio, using all the transmitted bandwidth on this medium.

All parts are as supplied to John Linsley Hood for his prototype and are of the highest quality. Mosfet types supplied may vary soon as the 3N201 is being made obsolete by some manufacturers.

PARTS FOR TUNER SECTION

Not including the optional 3W amplifier.

- T001 Set of 30 Metal Film Resistors..... £0.97
- T002 Set of Capacitors, including trimmers for RF and Oscillator..... £4.65
- T003 Set of Semiconductors for Tuner Section, Includes 3 dual gate mosfets, 2 diodes, 1 single gate mosfet and 2 dual Op-amps..... £7.06
- T004A Set of 6 Specially selected I.F. Coils..... £3.22
- T004B Set of 3 Oscillator Coils (LW, MW & SW)..... £2.00
- T005 Parts list, essential as different dielectrics are used for some capacitors..... £0.50
- RLH9 Photocopy of Article..... £0.70

LINSLEY HOOD ULTRA HIGH QUALITY 'AUDIOPHILE' AM/FM TUNER SYSTEM.

TUNER ENHANCEMENT PACKAGE. John Linsley Hood has recently proposed some upgrade modifications to the stereo decoder stage of this unit. These give improvements to stereo separation and frequency response, resulting in a much firmer stereo image. Current kits now incorporate these improvements and we can supply an upgrade kit for existing tuners.

The modification kit includes all the required components, a small sub-board, full instructions and a circuit diagram of the revised decoder. Also included at no extra charge is a complete, fully updated, parts list for all versions of the 400 Series Tuner.

Total Cost for the complete 'TUNER ENHANCEMENT PACKAGE', including VAT and postage is only..... £10.78