



INTEGREX LIMITED

Phase Locked Stereo Decoder

This kit contains all resistors, capacitors and semiconductors to construct the 'Phase Locked Stereo Decoder' as in 'Wireless world' September 1970.

All components are designer approved. The transistors are Ferranti E-line devices specially selected by the manufacturers, and are from the ZTX500 and ZTX108 series.

It will be noted that for ease of assembly component positions, power supply connections, input/output leads and test points are marked on the board.

IMPORTANT Check with component list that all devices are included.

Component lead configuration

TRANSISTORS - viewed from underside

PNP code number (TR6,7,13) ZTX500 OR ZTXA21L  
NPN colour code: Blue-White



Collector  
Base  
Emmitter

DIODES - the convention used is as follows:-



INTEGRATED CIRCUITS

Top view

IC1 & IC3 are type U6E7709 393

IC2 is type U6A7474 59X



CAPACITORS - the positive end of electrolytics has a PLUS sign:-



RESISTORS - be careful not to confuse the 2% resistors with the 5% resistors. The 2% resistors are characterised by either a red band or have value and tolerance printed on them.

Assembly

It is recommended that the components are mounted as follows:-

1. Resistors - preform leads before insertion.
2. Insert links using wire cut off resistors - there are 6 links - see later.
3. Insert I.C's. Take great care to install correct way round and that all pins are in their respective holes.
4. Insert diodes again observing correct polarity.
5. Transistors - Install PNP transistors first, there are 3 of these, they are TR6,7,13. Next install NPN's. Again ensure that the devices are correctly inserted and leave a space between the transistor case and the PC board of approx.  $\frac{1}{4}$ ".
6. Preset Potentiometers - observe coding.
7. Insert capacitors paying particular attention to Electrolytic capacitor polarities.

LINKS

From the layout it will be seen that one link, (associated with the output leakage path resistors) marked 'output link', has one of two positions; short and long.

Use the **SHORT** link for a +6 volt supply

Use the **LONG** link for a 12 volt centre tapped supply i.e. +6V and +12V. supply.

CONNECTIONS

For a power supply of +6V (stabilised) connect point A to +6V, point B to 0V, and point C to -6V.

Capacitor C1 has it's negative end connected to the junction of R1 and TR1 base; i.e. its positive end is at the input.

NOTE. Short link used.

For a power supply of +12V and +6V connect point A to +12V, point B to +6V and point C to 0V. In this case the polarity of C1 is reversed i.e. its negative end is at the input. Fig shows how this operation is achieved from a power supply of 15V or greater.

NOTE. Long link used.

SETTING UP PROCEDURE

Important note - The de-emphasis network in the FM tuner must be removed. De-emphasis is carried out in the decoder after separation.

SETTING UP PROCEDURE - CONT'D

With no input signal adjust RV2 and RV3 for zero volts (dc) between TP1 and point B and between TP2 and point B respectively. A voltmeter set to a 2 volt range is adequate.

Apply a stereo signal and adjust RV1 for high gain. Adjust RV4 to re-establish zero volts (dc) between TP1 and point B.

The system is now phase locked to the incoming 'pilot tone'.

To adjust the system gain, measure the voltage between TP2 and point B. Adjust RV1 to obtain -1.5 volts between these points. The system measures the pilot tone amplitude, this being directly related to the maximum audio signal. Overload cannot now occur, provided the decoder has been set up with an aerial signal above the limiting threshold of the receiver.

The decoder will not give good separation if the receiver is incorrectly aligned. If it is not possible to align the receiver correctly, which may be the case with some older models, the matrix resistor R56 should be adjusted for maximum separation during a stereo test transmission.

COMPONENT LISTIntegrated Circuits

IC1 & IC3 : Type U6E7709 393

IC2 : Type U6A7474 59X

Diodes

D1 - D8 : Type 1844 or equiv.

Transistors

TR6,7,13 are PNP type ZTX500, all others are NPN identified by a colour code of Blue and White, or marked ZTX108

Capacitors

No.	Value.	No.	Value.	No.	Value.
C1	10uF elec min. <sup>m</sup>	C9	47nF disc	C17	330pF
C2	47uF elec min. <sup>m</sup>	C10	1uF	C18	10uF elec
C3 *	27nF 1%	C11	1uF	C19	1 uF elec min. <sup>m</sup>
C4	0.1uF	C12	1nF	C20	1 uF elec min. <sup>m</sup>
C5	47uF elec	C13	1nF	C21	15nF
C6	0.1uF	C14	47nF disc	C22	15nF
C7	330pF	C15	0.47uF	C23	47nF disc
C8	5nF disc	C16	5nF disc		

NOTE 1nF = 1000pF = 0.001uF

10nF = 0.01uF etc.

\* In some kits C3 and R56 have been changed to 33nF and 11K respectively. This is due to a serious national component shortage and is a designer approved modification.

Resistors

No.	Value.	No.	Value.	No.	Value.
R1	47K	R23	1K	R45	470
R2	5.6K	R24	4.7K	R46	1.8K
R3	1K	R25	470	R47	1.8K
R4	1K	R26	470	R48	4.7K
R5	1.8K 2%	R27	10K	R49	1.8K
R6	18K	R28	5.6K	R50	10K
R7	1.8K 2%	R29	4.7K	R51	4.7K
R8	18K	R30	47	R52	100K
R9	1.8K	R31	470	R53	3.3K
R10	1.8K	R32	4.7K	R54	3.3K 2%
R11	10K	R33	470	R55	3.3K 2%
R12	10K	R34	1.2K	R56	10K 2%
R13	3.9M	R35	3.9K	R57	3.3K
R14	10K	R36	5.6K	R58	100K
R15	10K	R37	1.8K	R59	4.7K
R16	180K	R38	1.8K	R60	10K
R17	3.3K	R39	10K	R61	1.8K
R18	3.3K	R40	8.2K	R62	220
R19	100	R41	820K	RV1	10K
R20	100	R42	22	RV2	250
R21	1.5K	R43	22	RV3	250
R22	1K	R44	1.5K	RV4	5K

**NOTE** All resistor values given in ohms. Tolerance +5% unless otherwise stated.

Resistor Colour Code

This is denoted in 3 bands starting close to one end of the resistor.

Colour Value

Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Purple	7
Grey	8
White	9

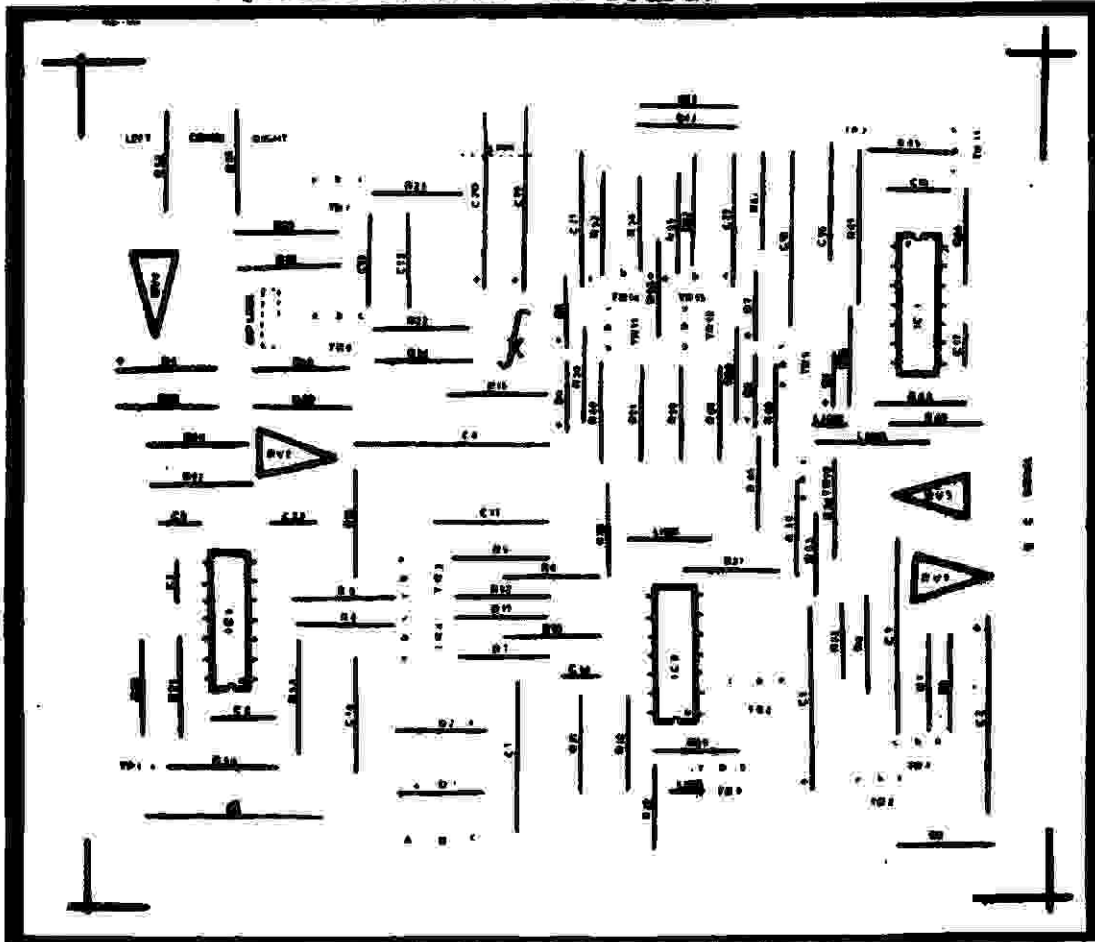
On the first and second bands the colour denotes the value directly. On the third band the colour denotes the number of zeroes.

e.g. 820K = Grey-Red-Yellow  
22 = Red-Red-Black

The multiplication factor K = x1000  
and M = x1000,000

### Component Layout

As well as being drilled and roller tinned, the printed circuit board has been screen printed i.e. component positions have been marked on the component side of the board.



Component Layout

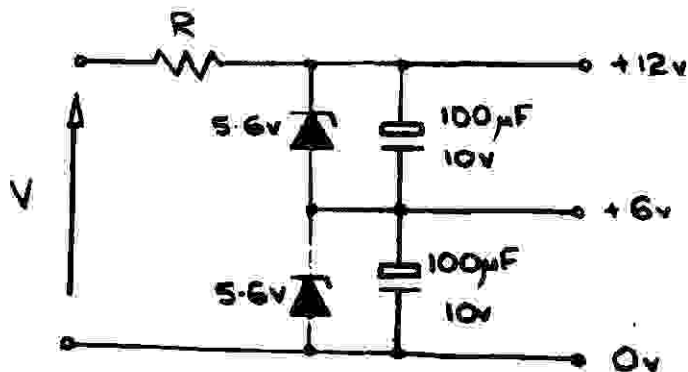


FIG 1

Operation from a power supply of 15 volts or greater.

NOTE.

$$R = \frac{V - 12}{0.1} \text{ ohms}$$

