

relatively low frequency, its characteristics are effectively imposed on the high frequency response of the phase locked loop. A simple low-pass filter can provide selectivity which is equivalent to that of a conventional superheterodyne receiver containing six tuned circuits at the intermediate frequency.

Phase locked loops are especially useful for receiving radio signals which are "buried" in noise. Their pass band can be made almost ideal for this purpose.

If the bandwidth of the low-pass filter is sufficiently narrow, the signal-to-noise ratio at the output of the voltage controlled oscillator can be considerably better than that at the input. The use of a low-pass filter with a large time constant will provide greater noise rejection and immunity to a momentary loss of the input signal, but it does result in a lower tracking rate, a reduced capture range and a longer pull-in time.

The low-pass filter limits the rate at which the voltage controlled oscillator can track the input signal. If the frequency of the latter changes at a greater rate than the maximum rate for the loop used, the loop will not remain locked. Capture will not occur at the new input frequency if this is outside the capture range. A low-pass filter with a relatively high cut off frequency will produce a higher tracking rate, but the ability of the loop to reject short term noise will be reduced.

THE INPUT LEVEL

If the input signal is relatively large, its amplitude will be limited either in the phase locked loop or in the preceding circuits. The capture range and the lock range are then independent of the signal amplitude.

Although a phase locked loop can act as its own limiter, greater freedom from noise and from spurious signals can be obtained when the input level is below the threshold at which limiting occurs. When the amplitude is high enough to drive the system outside the limit for linear operation, there are more cross modulation signals formed. However, higher input levels do result on a reduced pull-in time.

Next month: f.m. and a.m. demodulation techniques will be described.

PRACTICAL ELECTRONICS

● INDEX

An index for volume 8 (January 1972 to December 1972) is now available price 11p inclusive of postage.

● BINDERS

Easi-binders with a special pocket for storing blueprints and data sheets, etc., are available price £1.10p inclusive of postage. State required volume, e.g., Vol. 1, 2, 6.

Orders for Binders and Indexes should be addressed to the Post Sales Department, IPC Magazines Ltd., Carlton House, 66 Gt. Queen Street, London, W.C.2.

POINTS ARISING

WIDE RANGE PULSE GENERATOR (June 1973)

Capacitor C1 should be positioned in the circuit adjacent the contact of S1 and not, as shown in Fig. 2, in the direct connection from pins 2 and 3 to C2. It is shown correctly in the wiring diagram of Fig. 3.

THE 555 TIMER IC (June 1973)

It has been pointed out by a reader that any constructor attempting to use this chip to construct a 1:1 mark-space ratio monostable as described on pages 486 and 515 may run the risk of damaging TR1 because of a reduction of RA below a suggested value of 1 kilohm. The manufacturers have, in fact, not considered taking the resistance value below 1 kilohm.

AUDIO COMPRESSOR (August 1973)

In the base diagram of the 2N3708 transistor in Fig. 2 the base and emitter leads are shown transposed. Copper strip should be broken at F12. Resistor R13 should go to K29 not J29.

LIGHTING CONTROL UNIT (July 1973)

Page 612, the end of the fourth paragraph under the side heading "THE THYRISTOR" should read "so that the voltage applied to the load looks like Fig. 2 (c) not 3 (c)." Also, at the end of the section headed "TESTING" Fig. 4 should read Fig. 3.

PHASING UNIT (September 1973)

Changing the 10kΩ linear dual-gang potentiometer VR2 for a logarithmic type will enhance the performance of the unit.

P.E. SOUND SYNTHESISER (March 1973)

POWER SUPPLY REGULATORS

It should be noted that the maximum input voltage for the voltage regulator μ A7815 should not exceed 36V. Thus if the 30V Rec. Transformer by R. S. Components is being used in the power supply it is necessary to connect the 25V windings instead of the 30V windings given in March P.E.

Constructors using alternative 30V transformers should protect the regulator by means of an 8-2V 10W Zener diode connected between the bridge and C1 positive (cathode to the diode bridge). The Zener should be mounted on a heatsink, (2in x 2in 14 s.w.g. aluminium would suffice), which can be bolted to the power supply subframe lip above the transformer.

It will be necessary to insulate the heatsink from the subframe and separate heatsinks should be used for each Zener. The Z3B series of Zeners by Semitron would be suitable for use in the suggested circuit.

550 VOLT MEGOHMMETER (August 1973)

The function of VR2 was omitted. It should be adjusted so that the meter reads full scale with the leads shorted.

SOUND SYNTHESISER LECTURE

Our author Mr. G. D. Shaw will present a lecture-demonstration at the coming International Audio Festival and Fair, Olympia, London. The lecture will be given at 2 p.m. on Tuesday, October 23, 1973.