



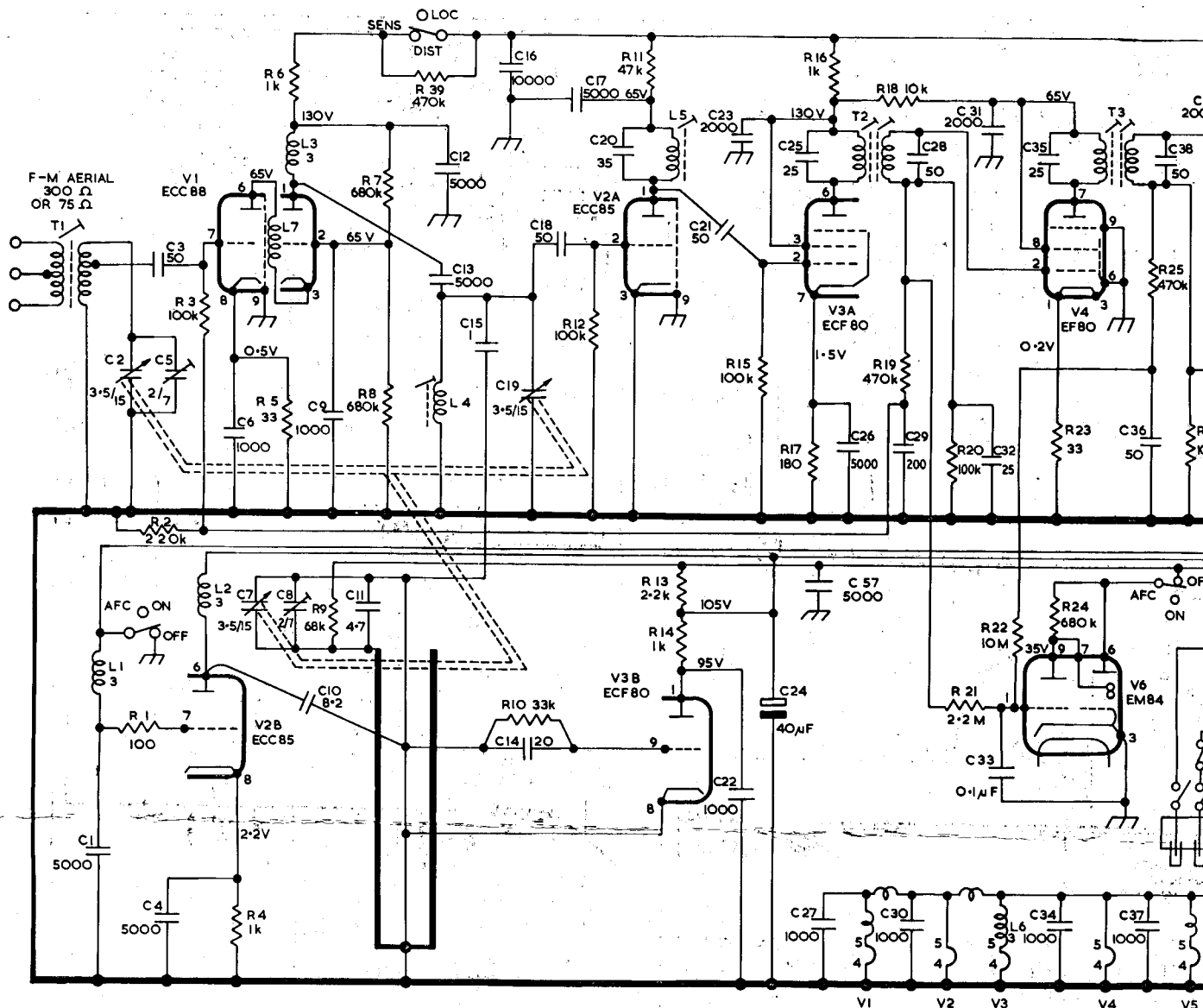
# 'TROUGH LINE STEREO' F. M. TUNER

## INSTALLATION • OPERATION • MAINTENANCE

### CONNECTING THE F. M. TUNER

1. This unit may be used free-standing on a table, or it may be mounted on a panel of any thickness, through a cut-out of  $10\frac{1}{8}'' \times 3\frac{3}{4}''$  (27.5 × 9.5 cms.). To mount on a panel: take off the cover by removing the wing-screw which passes through a hole in the cover fixing bracket and threads into a hank-bush in the centre of the rear panel of the tuner. Pass the body of the tuner through the cut-out until the front plate butts against the panel, replace the cover and wing-screw and tighten just enough to prevent the front plate on the tuner from slipping on the panel.
2. The mains transformer primary is wound for voltages of 110, 117, 130, 210, 230, 250 (40 to 60 c/s). The circular voltage selector (situated at the back of the tuner) should be withdrawn to its fullest extent, rotated so that the arrow indicates the voltage nearest to your supply and then reinserted.
3. When used with a LEAK amplifier the mains supply for the tuner can be obtained by inserting the 'SUPPLY POWER' plug into the 'A.C. OUTLET' socket on the amplifier.
4. The tuner is suitable for reception of mono broadcasts and stereo broadcasts using the world-wide standard GE-Zenith system of transmission. To obtain optimum results from stereo transmissions it is essential that the aerial terminals are fed with a strong signal. Although a short length of flex or inefficient indoor aerial may give good results from mono transmissions, to obtain the lowest background noise on a stereo transmission it is essential to use a first-class aerial correctly orientated. The optimum aerial position will be indicated by maximum closure of the tuning indicator pattern. The 300 ohm aerial input is balanced to earth. When using 300 ohm twin feeder, the conductors should be connected to the outer aerial terminals. When using an unbalanced 70-80 ohm feeder, the inner central conductor should be connected to either of the outside terminals and the outer screening connected to the centre chassis terminal.
5. **AUDIO OUTPUTS.** The two grey screened leads marked 'LEFT' and 'RIGHT' should be plugged into the L and R 'TUNER' input sockets on your stereo amplifier. The output level from these leads is much lower than from the LEAK "TROUGH-LINE II" or "TROUGH LINE 3" tuners and the sensitivity of the 'TUNER' input of the associated audio amplifier should be approximately 50mV with an impedance of 47,000 to 100,000 ohms.  
On LEAK valve pre-amplifiers the 'TUNER' pre-set input control should be turned to maximum. On the "STEREO 30" amplifier the slide switch should be set to 'HI' and resistors R5L and R5R may need changing from 4,700 ohms to 15,000 ohms. Please write to us if you possess a "STEREO 30" amplifier with a serial number below Z08000 and we will send you these two resistors.
6. **TAPE RECORDING.** In addition to the audio signals the output contains some 38 kc/s and 76 kc/s signals, the level of these signals being less than 5mV (-30dB on full output).  
If this tuner is directly connected to a tape recorder then in some instances spurious whistles may be experienced due to the interaction of these signals with the bias and erase oscillator in the tape recorder. Some tape recorder manufacturers are producing a filter for connection to the input of the tape recorder to eliminate this effect.  
If the tuner is connected to a tape recorder, via a LEAK amplifier, then a considerable reduction in level of whistle will be obtained if during recording the pre-amplifier filter is switched to 9 kc/s.
7. The tuner is earthed to its associated amplifier via the screening of the 'AUDIO OUTPUT' leads, and no additional earth connection should be made to any part of the tuner.





VOLTAGES ARE MEASURED ON A METER OF 20,000 Ω/VOLT, WITH NO AERIAL CONNECTED  
 RESISTOR VALUES ARE IN OHMS  
 CAPACITOR VALUES ARE IN MICRO-MICROFARADS } EXCEPT WHERE OTHERWISE SHOWN  
 CHOKE VALUES ARE IN MICRO-HENRIES  
 T2, T3, T4 AND L5 ARE TUNED TO 12.5 Mc/s  
 L8 AND T6 ARE TUNED TO 19 Kc/s, T7 IS TUNED TO 38 Kc/s AND L9 IS TUNED TO 67 Kc/s

\* C50 IS 3000pf ON EUROPEAN  
 C59 AND C60 ARE 2000 pf ON  
 C50 IS 4000pf ON U.S. MODEL  
 C59 AND C60 ARE 3000pf ON

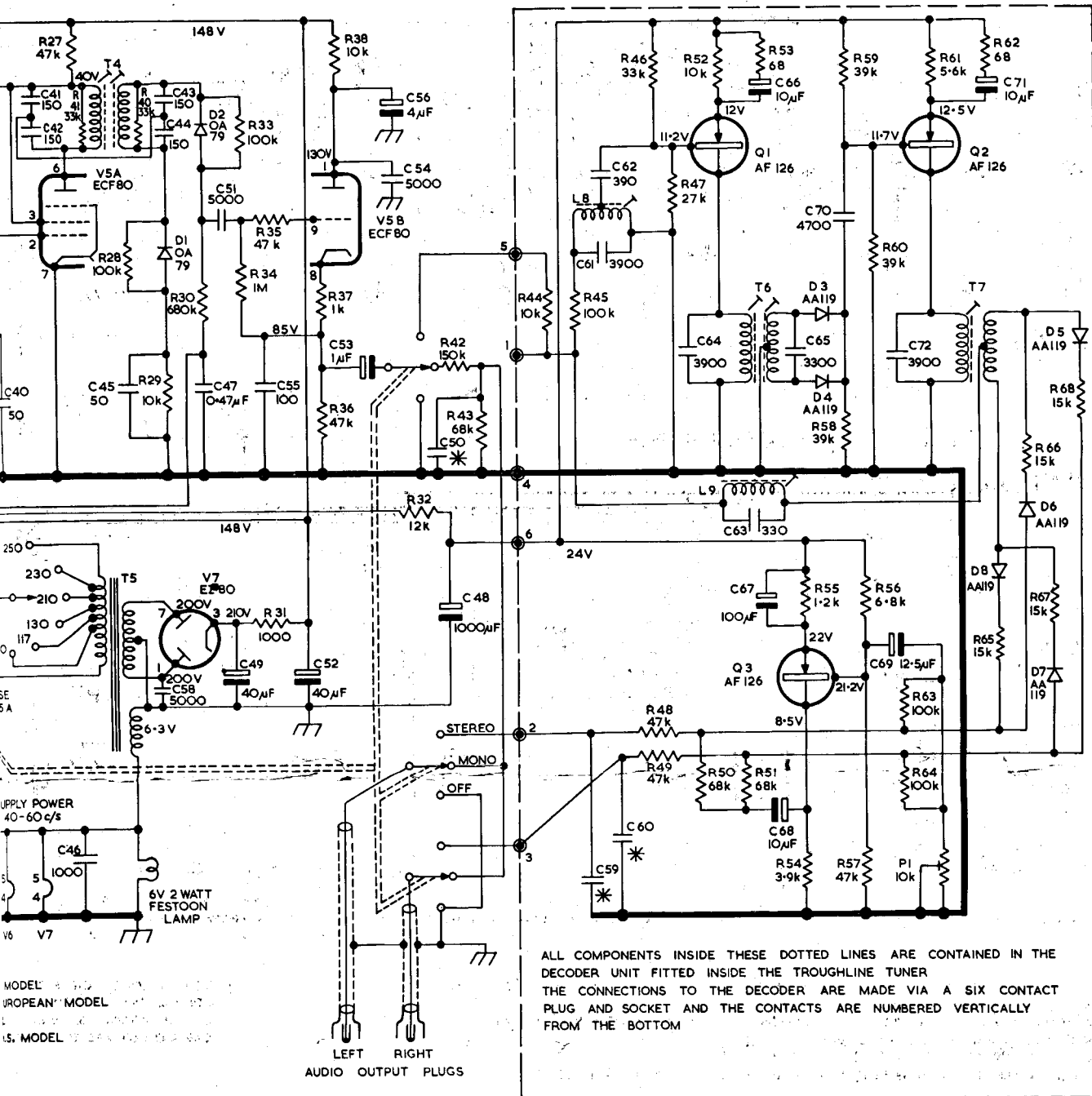
CIRCUIT

### SERVICING

On no account should the pre-set trimmer capacitor C8 or the pre-

It is not possible for an F.M. tuner of this calibre to be accurately generator complete with an accurate 'marker' oscillator, a D.C. val

These requirements should be emphasised to a potential service engineer should not be started.



ALL COMPONENTS INSIDE THESE DOTTED LINES ARE CONTAINED IN THE DECODER UNIT FITTED INSIDE THE TROUGHLINE TUNER THE CONNECTIONS TO THE DECODER ARE MADE VIA A SIX CONTACT PLUG AND SOCKET AND THE CONTACTS ARE NUMBERED VERTICALLY FROM THE BOTTOM

DIAGRAM

Do not tamper with or adjust in any way.

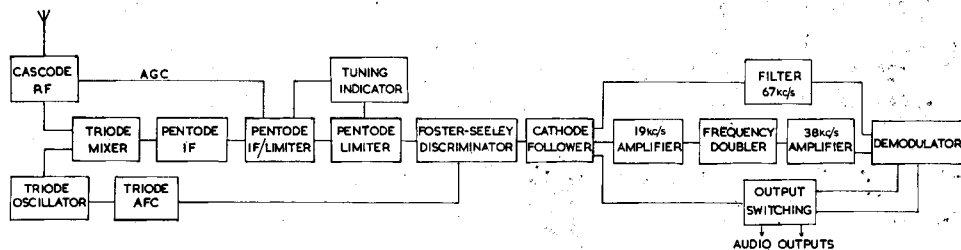
Aligned without using a double beam oscilloscope, F.M. signal voltmeter and a multiplex generator.

... engineer, and if all the above equipment is not available, work

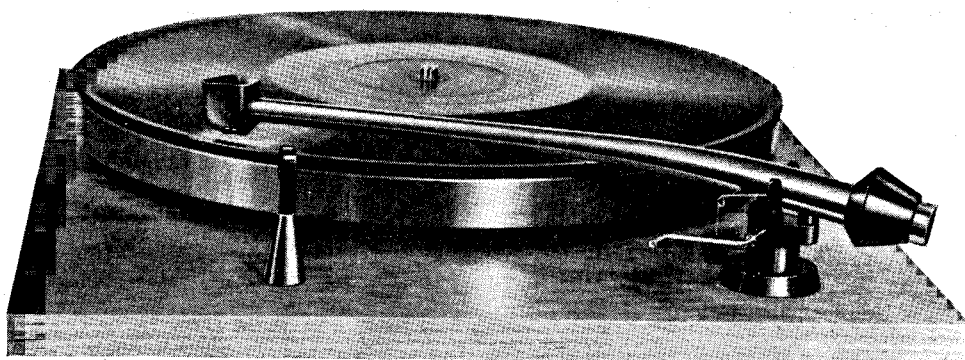
## SPECIFICATION

FREQUENCY RANGE:	88-108 Mc/s.
DRIFT:	3 kc/s maximum with AFC 'ON' 15 kc/s maximum with AFC 'OFF'
SENSITIVITY:	2 micro-volts at the aerial terminals for full limiting.
AERIAL IMPEDANCE:	The choice of 300 ohms balanced or 75 ohms unbalanced.
AUDIO OUTPUT:	150mV per channel from 75 kc/s deviation, i.e. 50-80mV per channel from normal transmissions. The input impedance of the associated audio amplifier should be between 47,000 ohms and 100,000 ohms.
CROSS-TALK:	Between L & R channels approx. -26dB at 1000 c/s and -20dB at 10,000 c/s.
POWER SUPPLY:	110, 117, 130, 210, 230, 250V, 40/60 c/s. Consumption 45 watts.
VALVES (TUBES), TRANSISTORS, DIODES:	2 × ECF80, ECC88; ECC85, EF80, EM84, EZ80, 3 × AF126, 2 × OA79, 6 × AA119, 1 festoon lamp 6V 2 watts.
CONTROLS:	
'OFF', 'MONO', 'STEREO'	This switch provides power switching and enables mono or stereo broadcasts to be received with minimum background noise.
'TUNE'	Flywheel action ensures easy and accurate tuning.
'AFC'	'OFF' position facilitates accurate tuning by visual strip indicator. 'ON' position locks station on tune and removes HT from indicator to prevent burning of indicator tube.
'SENSITIVITY'	'DISTANT' position gives maximum sensitivity enabling first-class reception of distant stations. 'LOCAL' position gives reduced sensitivity for use in locations where very strong signals are received, resulting in less inter-station noise and a reduction in spurious responses.
DIMENSIONS:	11½" × 4¼" × 8¼" deep. (29.2 × 10.8 × 21 cms.).
MOUNTING:	Free-standing on non-scratch felt feet or panel mounted through a cut-out of 10⅞" × 3¾" (27.5 × 9.5 cms.).
WEIGHT:	13 lbs. 8 ozs. (6.1 kgs.).

### BLOCK CIRCUIT DIAGRAM OF 'TROUGH LINE STEREO' F.M. TUNER



# LEAK STEREO PICKUP



The Leak Stereo Magnetic Pickup is the result of several years of intensive research and development work, and its unique appearance is the direct result of the application of every desirable engineering requirement necessary to minimise distortion.

To obtain optimum results, the arm and cartridge have been designed as an integrated system; this avoids additional mass at the head inherent in all universal arm and cartridge designs.

The moving mass seen at the stylus tip, which is less than 1 milligram, and the compliance are such that continuous contact with the record groove walls is maintained at the highest accelerations, thus preventing intermodulation distortion due to uncontrolled stylus movement.

Elliptical stylus for minimum tracing distortion on both stereo and mono records.

The coils are individually screened with mu-metal and the whole cartridge is enclosed in a mu-metal case to avoid hum pick-up.

The stylus is on the axis of the arm to avoid lateral unbalance and the generating axis has an angular offset for minimum tracking distortion.

The single pivot arm bearing reduces friction to the low value of 10 milligrams. Light viscous damping prevents emphasis of rumble. The pivot is at record level, so that wow from warped records is reduced to a minimum.

Correct tracking at all frequencies, at low tracking weight, reduces stylus and record wear.

Built-in raising and lowering device.

<b>CARTRIDGE:</b>	Variable reluctance stereo/mono.
<b>STYLUS:</b>	Elliptical diamond, 0.0007" major radius, 0.0003" minor radius. The stylus assembly is replaceable by the user.
<b>PLAYING WEIGHT:</b>	2 grams, pre-set.
<b>TIP MASS:</b>	Less than 1 milligram.
<b>COMPLIANCE:</b>	$10 \times 10^{-6}$ cm/dyne lateral, $10 \times 10^{-6}$ cm/dyne vertical.
<b>FREQUENCY RANGE:</b>	30 c/s-20 kc/s. There is no high frequency or other peak to cause noise or "edgy" reproduction.
<b>SEPARATION:</b>	-25 dB at 1 kc/s.
<b>OUTPUT:</b>	1.2 mV per cm/sec r.m.s. recorded velocity into 47 k ohm-100 k ohm amplifier input. This will load an amplifier of 6 mV sensitivity.
<b>ARM:</b>	Single pivot, with not greater than 10 milligrams friction. Built-in raising and lowering device.
<b>PRICE:</b>	Complete, £23 . 0 . 0d. (plus Purchase Tax £4 . 4 . 2d. in U.K. only.)

## H. J. LEAK & CO., LTD.

BRUNEL ROAD · WESTWAY FACTORY ESTATE · LONDON W.3