

**Eddystone**

**HF/MF  
COMMUNICATION  
RECEIVER  
MODEL 830/9**

**EDDYSTONE RADIO LTD.  
ALVECHURCH ROAD  
BIRMINGHAM 31**

## EDDYSTONE MODEL 830/9

The EDDYSTONE Model 830/9 is a variant of the standard 830/3 receiver from which it differs in the following respects:-

### 1. SYNTHESIZED WORKING.

Provision is made for controlling all three local oscillators from an external synthesizer. Drive requirement for each oscillator is 0.3-1.0V across 75Ω. Normal manual operation is possible when synthesized working is not required, the changeover taking less than half an hour.

Circuit modifications which have been incorporated to permit synthesized operation are listed below. The sockets referred to are mounted at the rear of the set and are labelled to indicate the frequency of the synthesized input. Sockets, Coaxial No. 1, are employed. Changeover switches are set in the NORMAL position when the receiver is despatched from the factory.

#### (a) 1st Local Oscillator.

The feedback circuit is interrupted at S10 and the feedback windings on the oscillator coils are returned via the normal range switching to the synthesizer input at SKT8. The feedback windings serve as coupling coils and the 1st Local Oscillator valve (V12A) functions as a Buffer Amplifier to feed the 1st Mixer Stage V2.

To calculate the required 1st Oscillator synthesizer drive frequency for reception on a given signal channel in the range 1.5-30 Mc/s, apply the following formula:-

$$\text{SYNTHESIZER DRIVE FREQ.} = \text{REQUIRED SIGNAL FREQ.} + \text{1ST INTERMEDIATE FREQ.}$$

The normal 1st IF employed in a synthesized Piccolo installation is 1.3 Mc/s but any frequency between 1.25 - 1.45 Mc/s could be used if required.

The switch for changing from NORMAL to SYNTHESIZED operation is located at the front of the coil box near the 8-bank crystal holder. Changeover can be effected without removing the gang cover if a small screwdriver is used to trip the switch dolly into the required position. Access is through the cut-out found adjacent to the crystal holders, switch positions being clearly marked on the top of the gang cover.

The socket for feeding in the synthesized drive is the centre one of the three sockets at the rear (SKT8).

#### (b) 2nd Local Oscillator.

A cathode-tap oscillator is used in place of the tuned-anode circuit found on the standard 830/3 receiver. Drive to the 2nd Mixer Stage (V4) is taken from the anode of the oscillator (V3) and not from a separate link winding as before.

External drive from the Synthesizer is fed in at SKT7 and taken to a tap on the normal oscillator coil L36. The oscillator is stopped by the changeover switch S9 which breaks the cathode feedback circuit and returns the cathode direct to ground. V3 serves as a Buffer Amplifier when using external drive.

Normal operation with the 2nd Oscillator crystal controlled is still possible as on the standard 830/3 receiver. The link ("X") must be removed as before when fitting the crystal which should be a series-mode type in the range 1150 - 1350 kc/s.

(b) 2nd Local Oscillator. (contd.)

The modifications carried out on the 2nd Oscillator circuit make it necessary to employ a tuning capacitor of greater capacity swing than that fitted on the 830/3 version. In consequence, the tunable IF transformer L34/L35 is also modified since this is ganged to the 2nd Oscillator tuning.

Drive from the external synthesizer must lie in the range 1.15 - 1.35 Mc/s (usually 1.2 Mc/s on a normal Piccolo installation). It is of course necessary to adjust the INCREMENTAL TUNING CONTROL to align the tunable IF transformer to the appropriate 1st intermediate frequency and the oscillator circuit to the corresponding synthesizer frequency. Set to "50 RED" (marked with black spot) when using a 1.2 Mc/s standard input.

The NORMAL/SYNTHEZIZED switch (39) is located on top of the 2nd Mixer/Osc. Unit and is immediately accessible on removal of the cabinet. The socket for feeding in the synthesized drive is the left-hand of the three sockets when the receiver is viewed from the rear (SK77).

(c) 3rd (Seat) Oscillator.

External synthesized drive at 100 kc/s is applied at SK79 and is taken to an additional tap on the normal beat oscillator coil L38. The changeover switch S11 is arranged to remove the cathode feedback when operating with external drive. The switch is located on the side of the CW/SSB Detector Unit which is found on the 2nd IF chassis at the left-hand side of the receiver.

SK79 is the right-hand of the three sockets when the receiver is viewed from the rear.

When operating with synthesized drive and receiving either CW or SSB signals it is necessary to set the MODE SWITCH to the "CW" position to complete the ET4 feed to the screen of the CW/SSB Detector (V13). The BFO PITCH ADJUSTOR is inoperative when using external drive.

2. CRYSTAL FILTER.

A dual-crystal bandpass filter with a bandwidth of approximately 350 c/s centred on 300.490 kc/s takes the place of the normal single crystal filter. The modified filter is arranged to accept the tone frequencies employed in the Piccolo system and is brought into circuit by two microswitches (S3 & S8) which are operated by the SELECTIVITY CONTROL.

Marking on this control is identical to that found on the 830/3 receiver. The selectivity arrangements now provide two selectable bandwidths in addition to the Piccolo position. At "AM" the bandwidth is of the order 4 kc/s at 6dB down and at "SSB" 2.5 kc/s. The Piccolo filter comes into circuit when the control is advanced to the "CW" position.

The new filter occupies the same chassis position as the original but the microswitches and crystals are housed within the can and not externally as on the 830/3 receiver.

3. IDENTIFICATION.

All 830/9 receivers are marked "MODEL 830/9" at the top right-hand side of the main scale to facilitate easy identification when rack-mounted (830/9/RM).

Three distinctly different versions of the 830/9 are in current use. These can be identified by reference to the Ser. No plate (see Appendix at rear of folder).

#### 4. PERFORMANCE.

Existing figures quoted in the standard handbook apply also to the 830/9 except for IF Selectivity which is quoted in para. 2. on the previous page.

#### INSTALLATION OF 830/9 RECEIVER

The 830/9 is despatched from the factory with the NORMAL/SYNTHESIZED switches set in the "NORMAL" position. To change to synthesized operation, remove the cabinet and set all three switches to "SYNTHESIZED." No further internal adjustments are necessary and the cabinet can be replaced ready for normal installation following the instructions in the standard 830 handbook.

On completion of the normal installation procedure, terminate the synthesizer drive cables with the Plugs Coaxial No. 1. supplied and mate these with the sockets at the rear of the receiver.

It should be noted that it is advisable to disconnect the synthesizer plugs when using the receiver with internal oscillator control.

#### TUNING INSTRUCTIONS

When setting up an 830/9 receiver with external oscillator drive, the INCREMENTAL TUNING CONTROL must be adjusted to align the 1st IF and 2nd Oscillator tuned circuits to the appropriate frequencies. The actual setting for this control can be determined by reference to the Table on page 22 of the handbook. The first column can be read as "Synthesizer Drive Frequency", while the "Incremental Setting" is taken from the third column.

The MAIN TUNING CONTROL must be set to the appropriate signal frequency as indicated on the main scale to align the signal frequency circuits as when using crystal control of the 1st Local Oscillator.

On the lower frequencies, when using a 1st IF close to the end of the incremental range, it may be found necessary to adjust the MAIN TUNING and PEAK-RF controls independently to ensure that accurate signal frequency alignment and optimum oscillator injection are obtained, (i.e. use the MAIN TUNING to align the Oscillator circuit and the PEAK-RF control to align the signal frequency circuits). On the higher frequencies where the selectivity of the oscillator circuits is less pronounced, the PEAK-RF knob can be set to mid-travel, all tuning then being carried out with the MAIN TUNING.

The MODE SWITCH must be set to "CW" or "SSB" to apply HT to the detector stage. The normal BFO PITCH ADJUSTOR is inoperative when using synthesized drive but the AGC time constant and delay switching provided by the MODE SWITCH functions normally (i.e. the delay is reduced and the time constant increased when switched to either of the two "SSB" positions).

All other controls function normally with the exception of the SELECTIVITY CONTROL which provides the bandwidths detailed on page 2, para. 2.

HANDBOOK AMENDMENTS

Page 36.

Amend C6 to read:- "30pF."

Page 37.

Amend C64 to read:- "8-170pF."

Amend C66 to read:- "200pF Polystyrene 5% 125V."

Amend C67 to read:- "50pF Tubular Ceramic 10% 750V."

Page 38.

Amend C70 to read:- "50pF Silvered Mica 5% 350V."

Amend C73 to read:- "8-170pF."

Amend C75 to read:- "15pF Tubular Ceramic 10% 750V."

Amend C76 to read:- "15pF Tubular Ceramic 10% 750V."

Amend C78 to read:- "8-170pF."

Delete:- "C88, C89 and C90."

Page 39.

Amend C140 to read:- "40pF."

Page 40.

Add C195 to C203:-

"C195	300pF Silvered Mica 1% 350V."
"C196	340pF Silvered Mica 1% 350V."
"C197	0.0047 $\mu$ F Polystyrene 1% 125V."
"C198	0.0091 $\mu$ F Polystyrene 2% 125V."
"C199	0.0091 $\mu$ F Polystyrene 2% 125V."
"C200	35pF Tubular Ceramic 10% 750V."
"C201	0.0047 $\mu$ F Polystyrene 1% 125V."
"C202	0.0047 $\mu$ F Polystyrene 1% 125V."
"C203	2.5-14pF (each section) Air-spaced differential trimmer."

Amend R19 to read:- "1500."

Page 42.

Amend L34 and L35 to read:- "D3455."

Amend L36 to read:- "D3510."

Amend L38 to read:- "D3511."

Add L39, L40, L41 and L42 to read as follows:-

L39	. . . . .	Crystal Filter Input Transformer	{pri.}	. . . . .	D3689
L40	. . . . .	Crystal Filter Input Transformer	{sec.}	. . . . .	D3690
L41	. . . . .	Crystal Filter Output Transformer	{pri.}	. . . . .	D3689
L42	. . . . .	Crystal Filter Output Transformer	{sec.}	. . . . .	D3689

Page 43.

Add CH3 to read as follows:-

CH3	. . . . .	2nd Oscillator Cathode Choke	. . . . .	D3509
-----	-----------	------------------------------	-----------	-------

Delete P2 and substitute the following (no Circuit Ref.):-

-	. . . . .	Crystal Bandpass Filter Unit (with crystals)	. . . . .	LP2999
---	-----------	--	-----------	--------

Page 43. (contd.)

Delete XL1 and substitute the following:-

XL3	100.640 kc/s $\pm$ 0.01% 0-60°C.	Glass Type JCF199 with lead-out wires	. .	7212P
XL4	100.340 kc/s $\pm$ 0.01% 0-60°C.	Glass Type JCF199 with lead-out wires	. .	7213P

Add S8-S11 as follows:-

S8	Crystal Filter Switch	. . . . .	. .	6365P
S9	Miniature SPDT Toggle Switch	. . . . .	. .	6760P
S10	Miniature SPDT Toggle Switch	. . . . .	. .	6760P
S11	Miniature SPDT Toggle Switch	. . . . .	. .	6760P
Amend C64/73/78 to read:- "3 x 6-170pF"				6822P

Page 44.

Add SKT7-SKT9 as follows:-

SKT7	Synthesizer Input Socket	. . . . .	. .	6987P
SKT8	Synthesizer Input Socket	. . . . .	. .	6987P
SKT9	Synthesizer Input Socket	. . . . .	. .	6987P

Amend Scale Plate to read:- "6257/LP."

Add:-	Rear finger plate (A30/9)	. . . . .	. .	D3543
-------	---------------------------	-----------	-----	-------

Amend CW/SSE Detector Unit to read:- "LP2326."

## A P P E N D I X

### VARIANTS OF ONE 830/9 RECEIVER

There are three different versions of the 830/9 receiver in current use. The following information is provided to permit positive identification of any particular receiver. All versions have provision for synthesized working.

#### Group 1.

Comprises four receivers only bearing the following Ser. Nos:-

LQ~~399~~    LQ~~400~~    LQ~~413~~    LQ~~414~~.

These were the first 830/9 receivers to go into service and are suitable for reception of USB Piccolo signals only. (Filter centre-frequency = 99.510 kc/s)

#### Group 2.

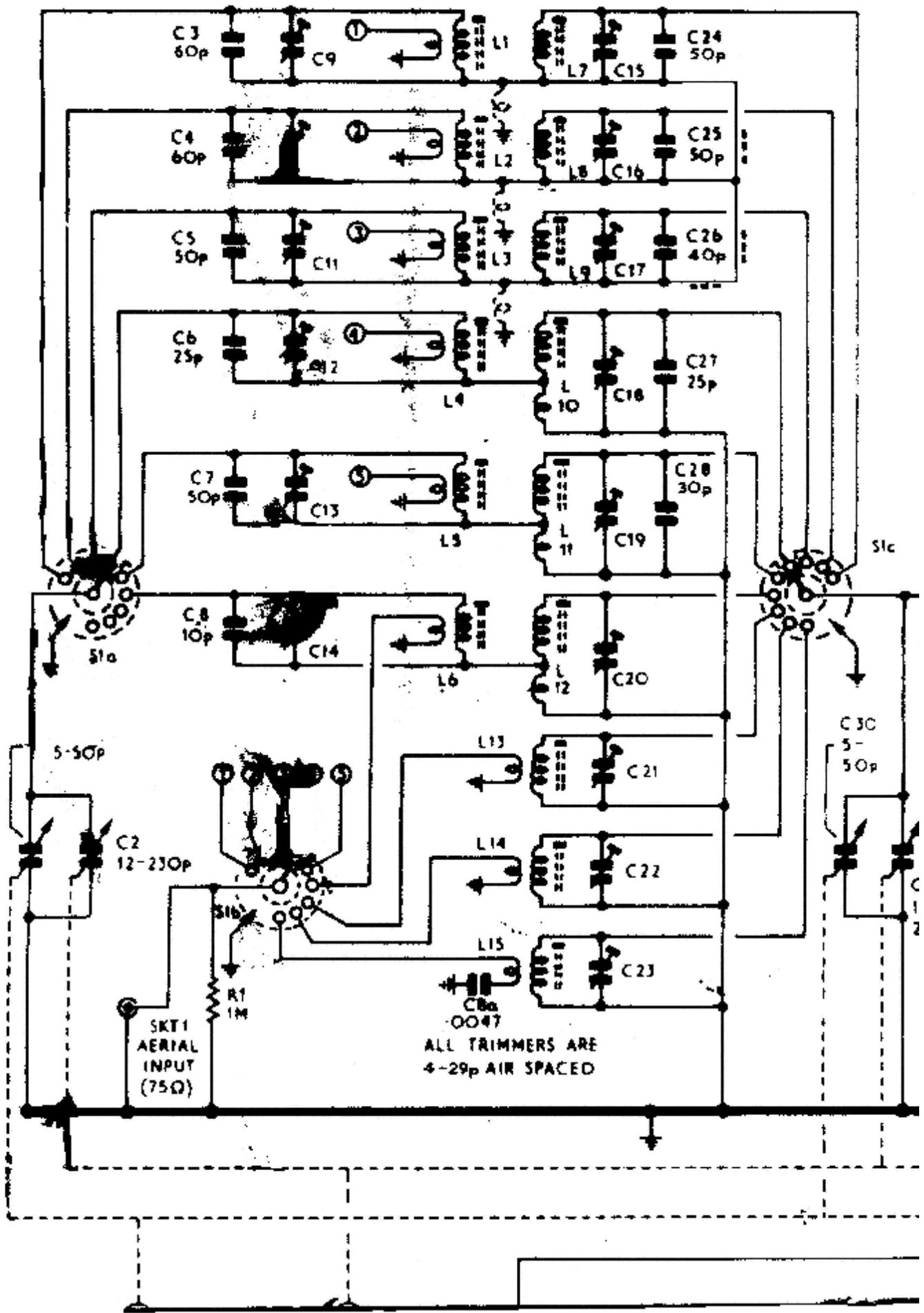
A total of 27 receivers with Ser. Nos:-

BQ~~804~~ to BQ~~830~~ inclusive.

These receivers differ from Group 1 receivers in that provision is made for sideband-switching to permit reception of both USB and LSB Piccolo signals. (Filter centre-frequency = 99.510 kc/s)

#### Group 3.

Receivers produced after September 1966 fall in this category and are suitable for reception of USB Piccolo signals only. (Filter centre-frequency = 100.490 kc/s)

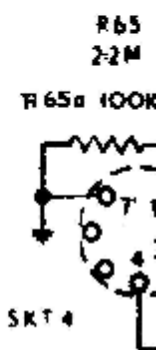
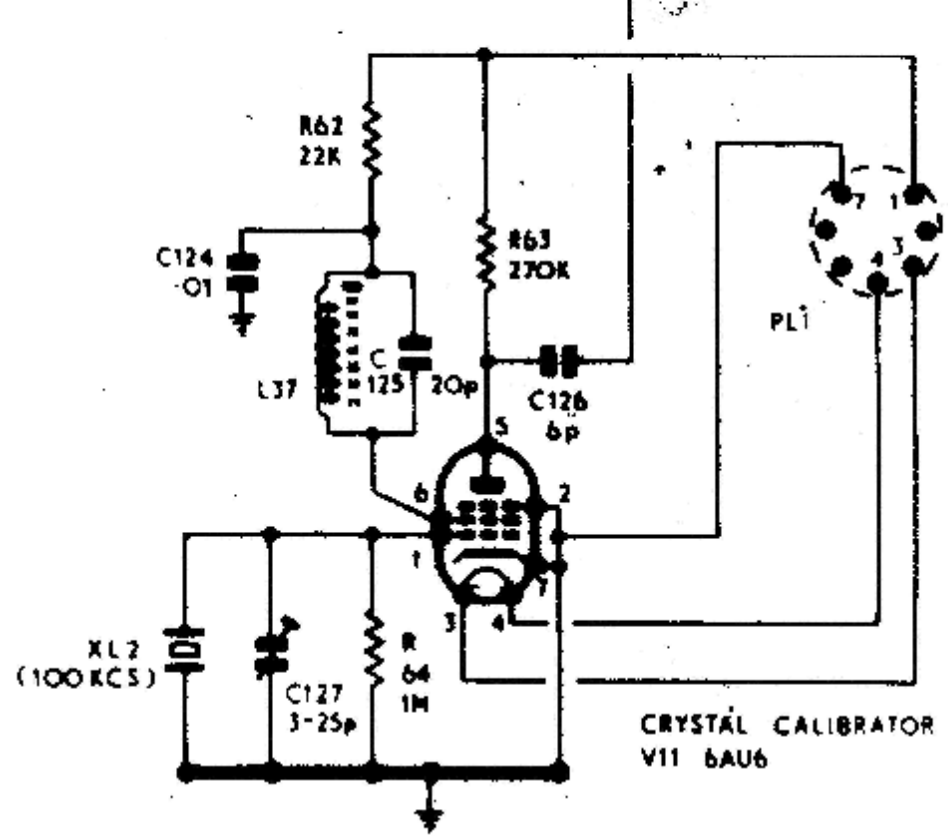




PEAK RF

MAIN TUNING

HT

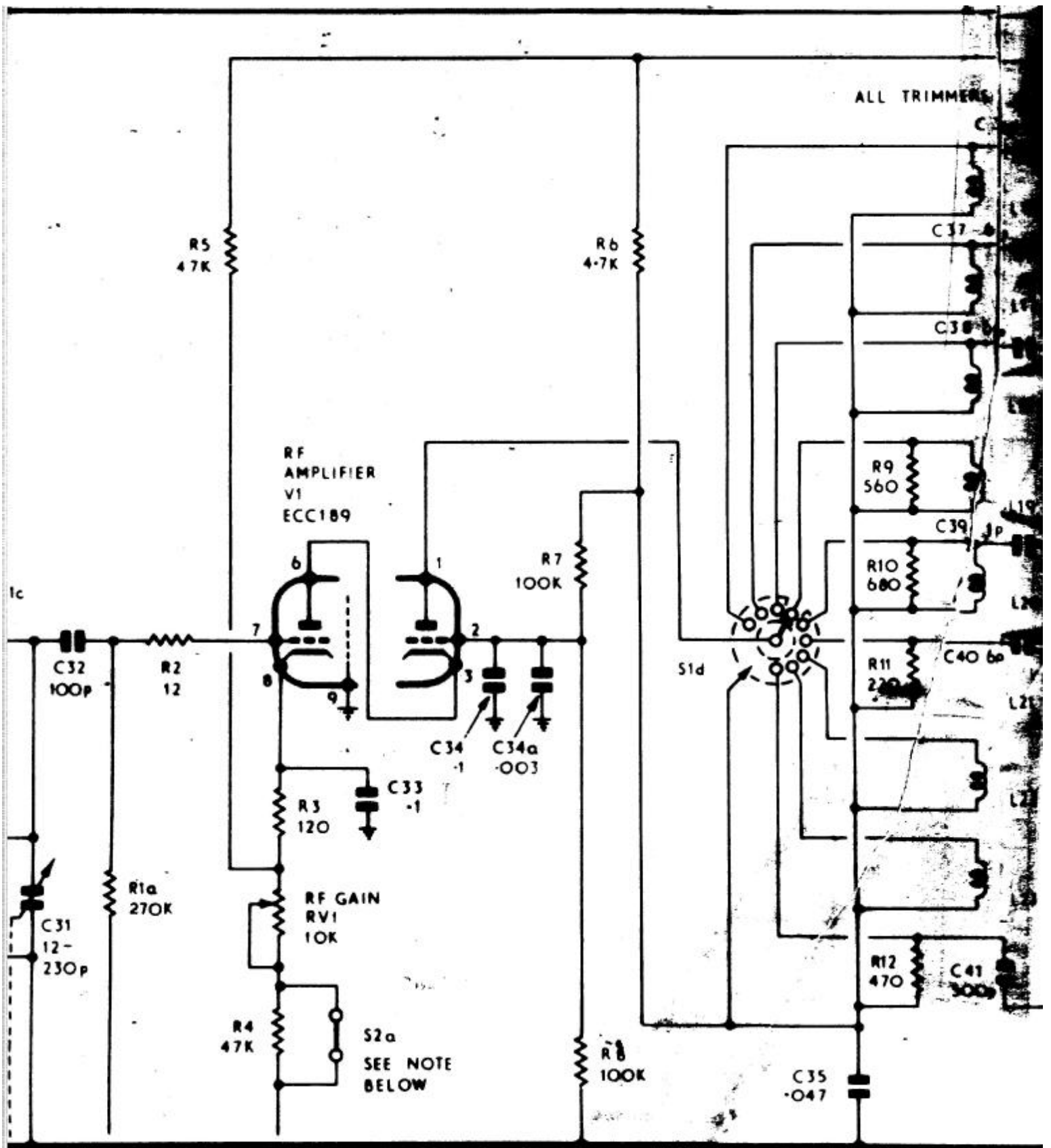


NOTE BOT  
CAL  
ARE  
POS  
IS A  
OPEI

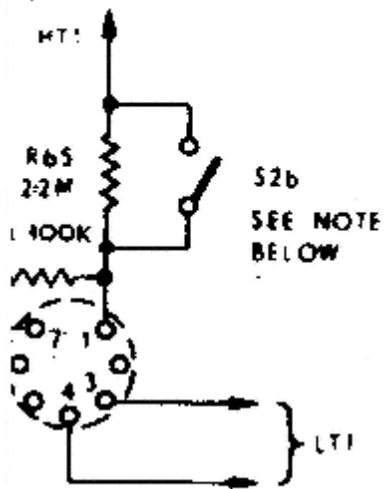
# MODEL 830/9

GROUPS 1 AND 3 ONLY

SEE BP1157 FOR GROUP 2 C

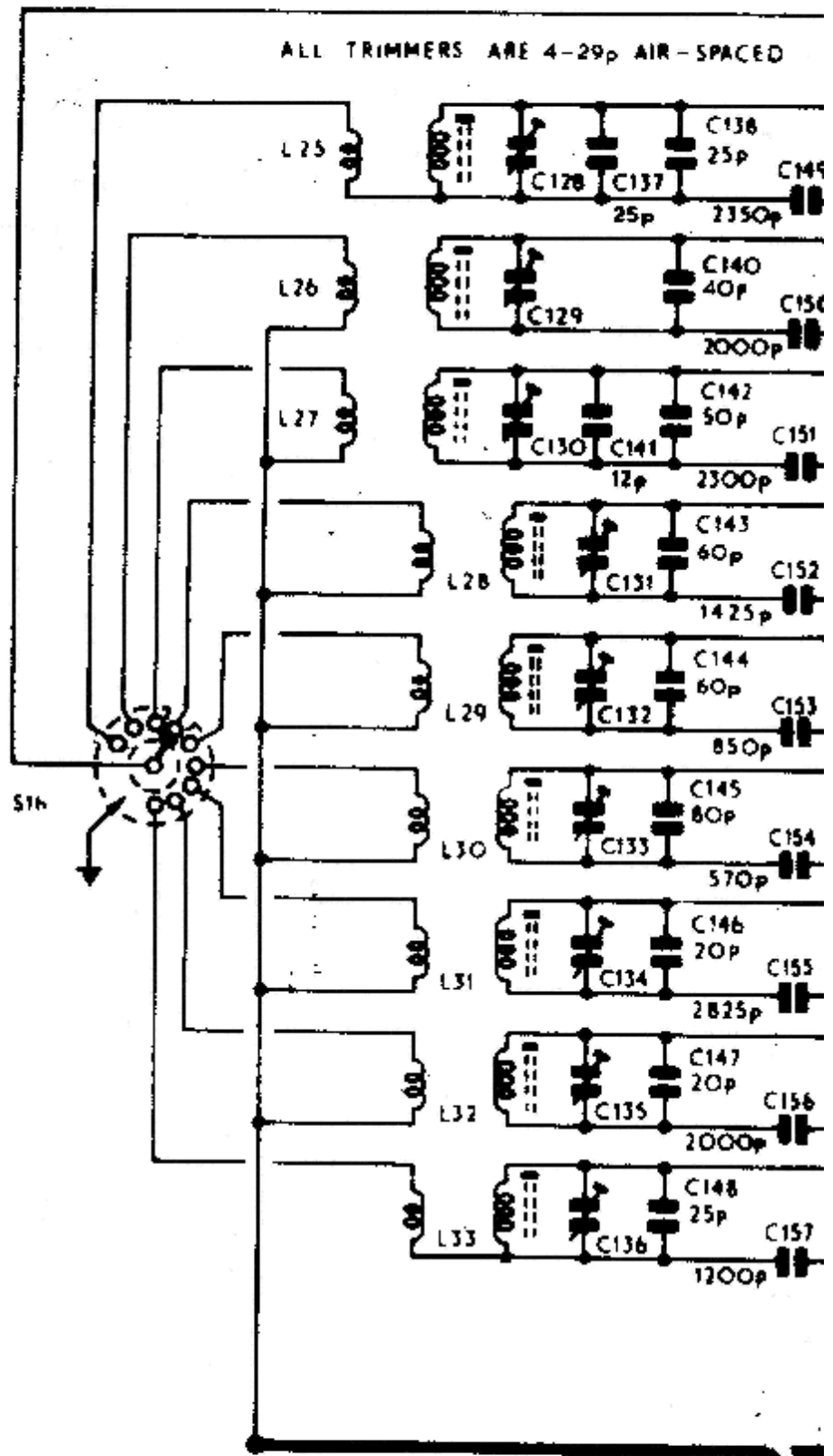


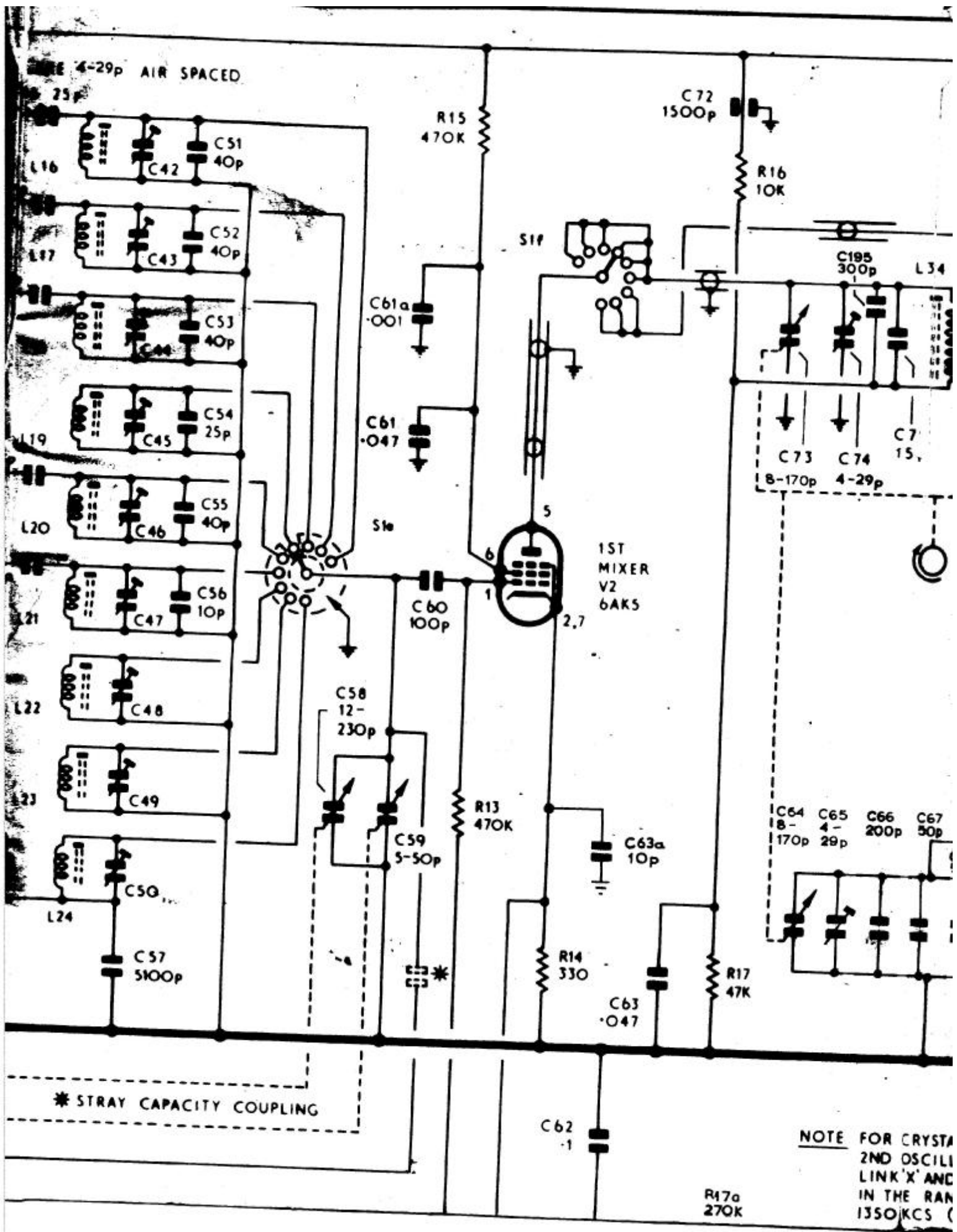
ALL SECTIONS OF S1 ARE SHOWN AT RANGE 4

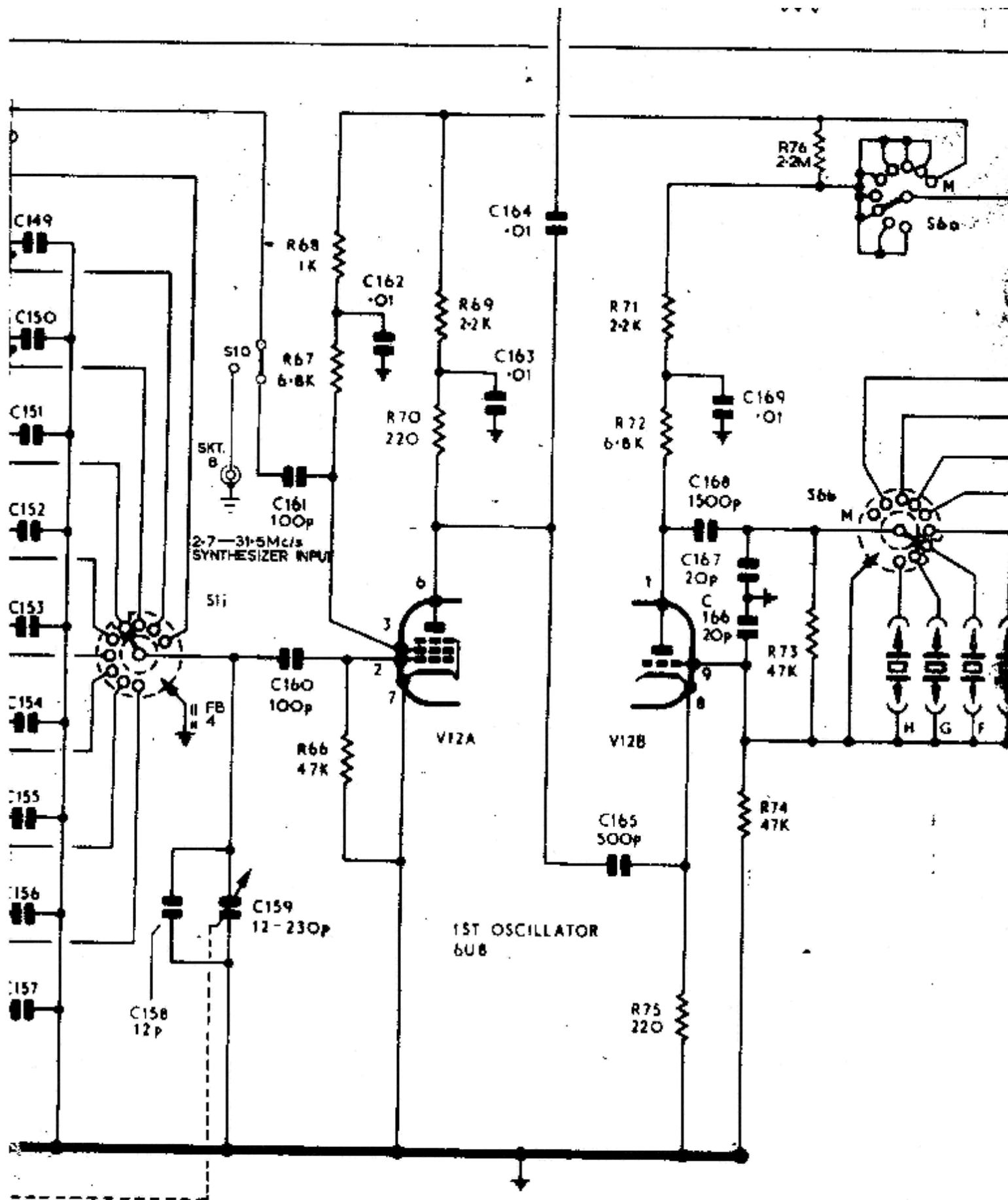


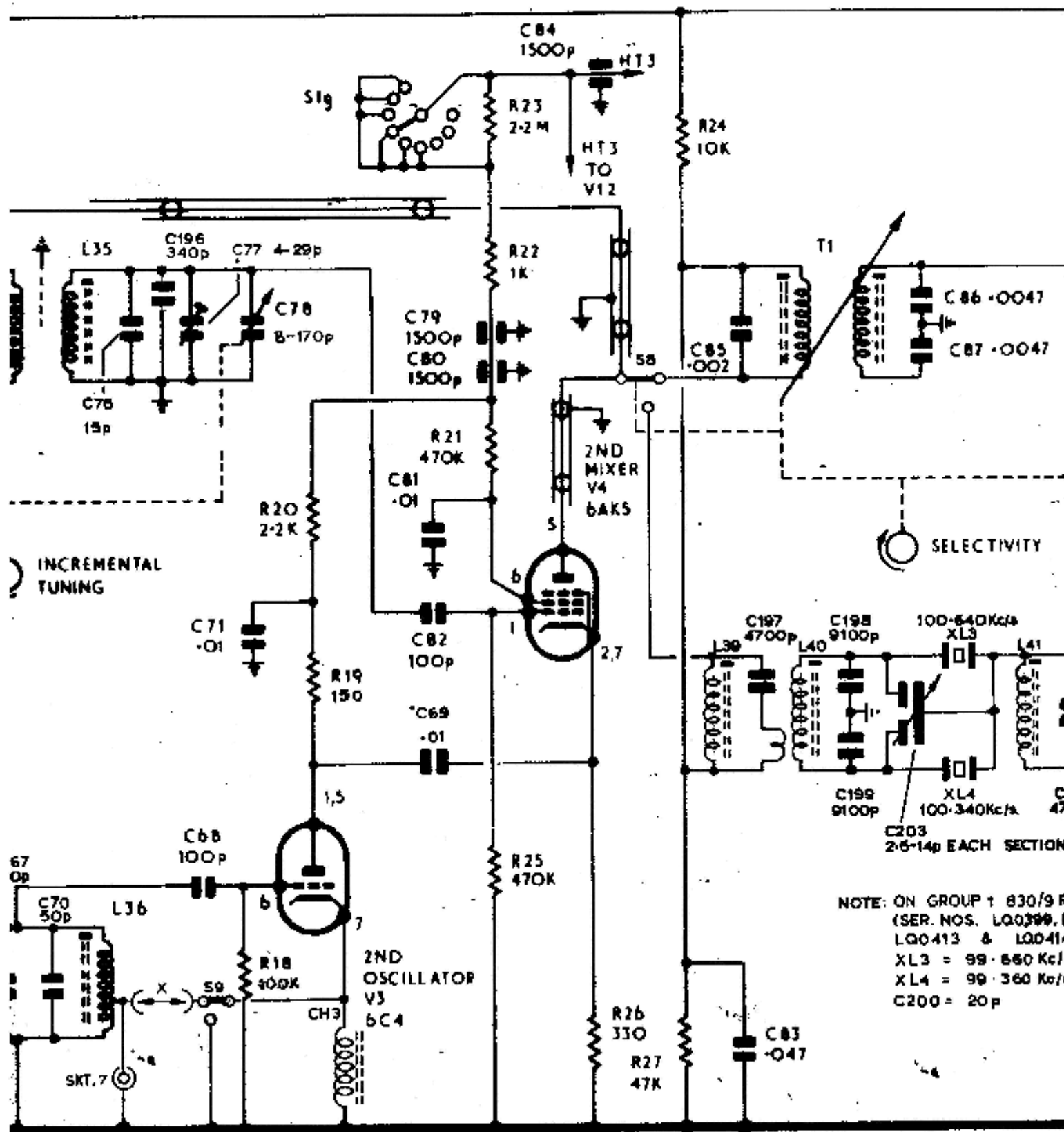
BOTH SECTIONS OF THE CALIBRATOR SWITCH (S2) ARE SHOWN IN THE 'OFF' POSITION. WHEN SWITCH IS AT CALIBRATE S2a OPENS AND S2b CLOSES

19.  
NLY.  
CIRCUIT.





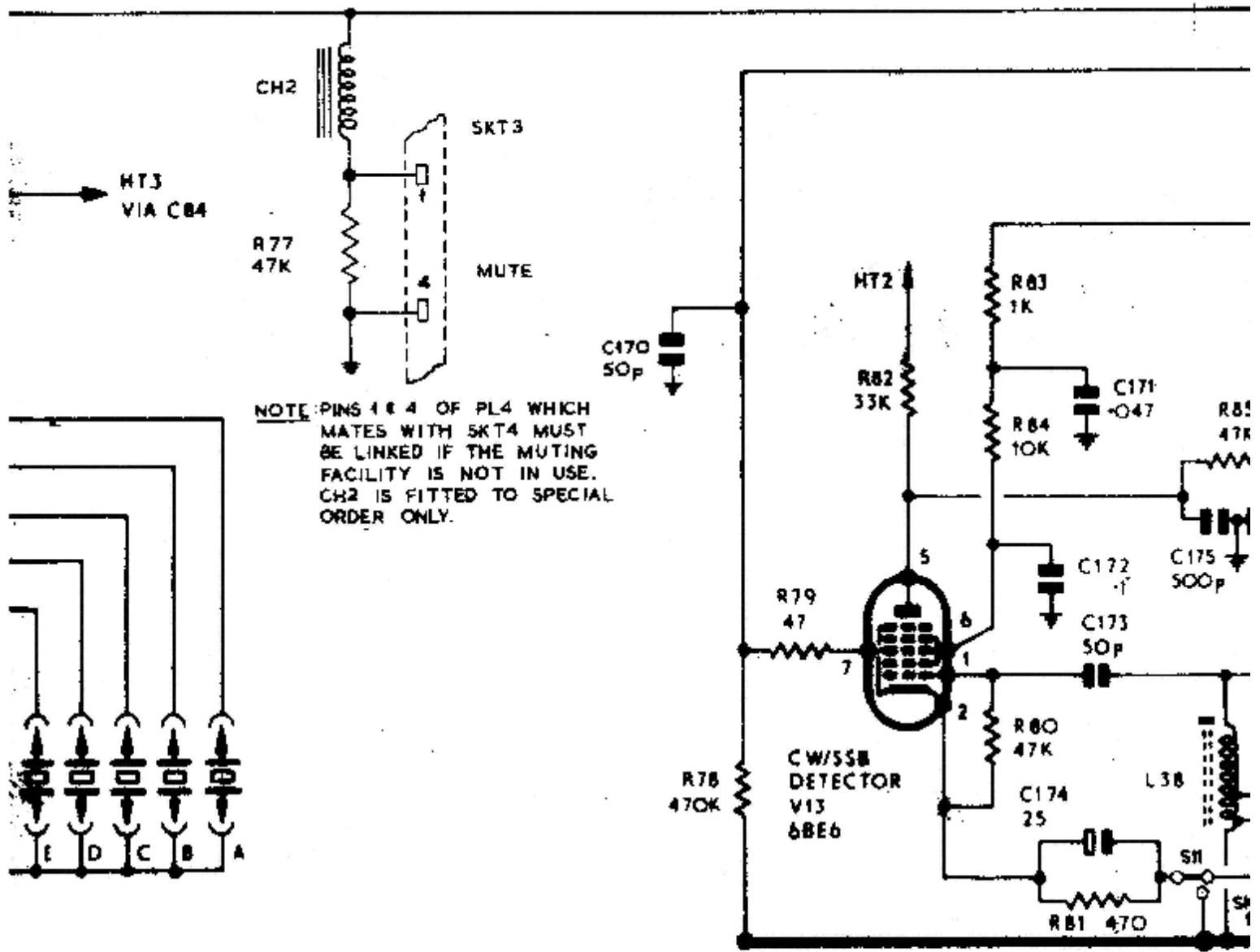




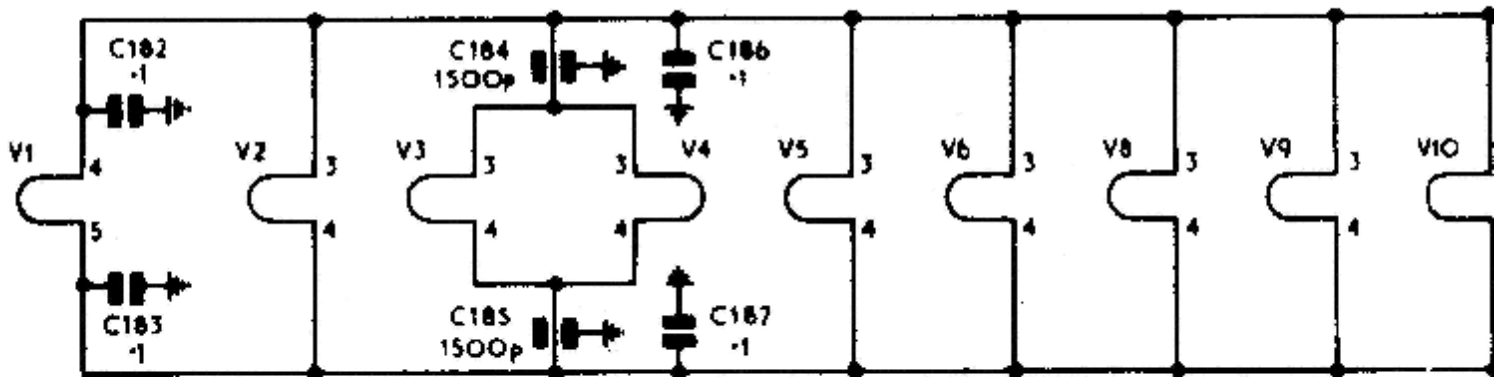
1.2 Mc/s.  
SYNTHESIZER INPUT.

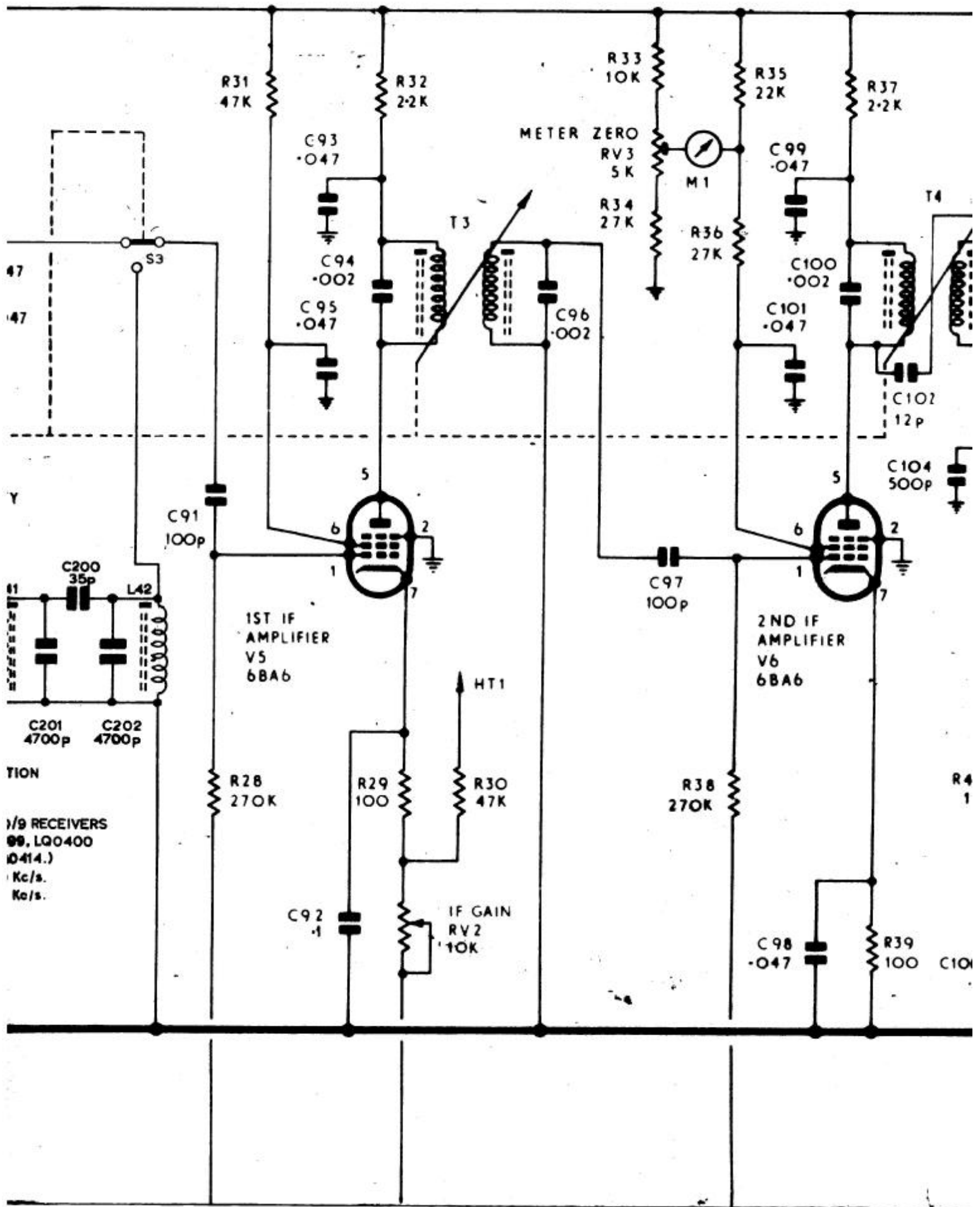
NOTE: ON GROUP 1 830/9 F  
(SER. NOS. LQ0399.1  
LQ0413 & LQ0414)  
XL3 = 99.860 Kc/s  
XL4 = 99.360 Kc/s  
C200 = 20p

CRYSTAL CONTROL OF  
OSCILLATOR REMOVE  
K AND FIT CRYSTAL  
RANGE 1150 TO  
1650 (STYLE D)

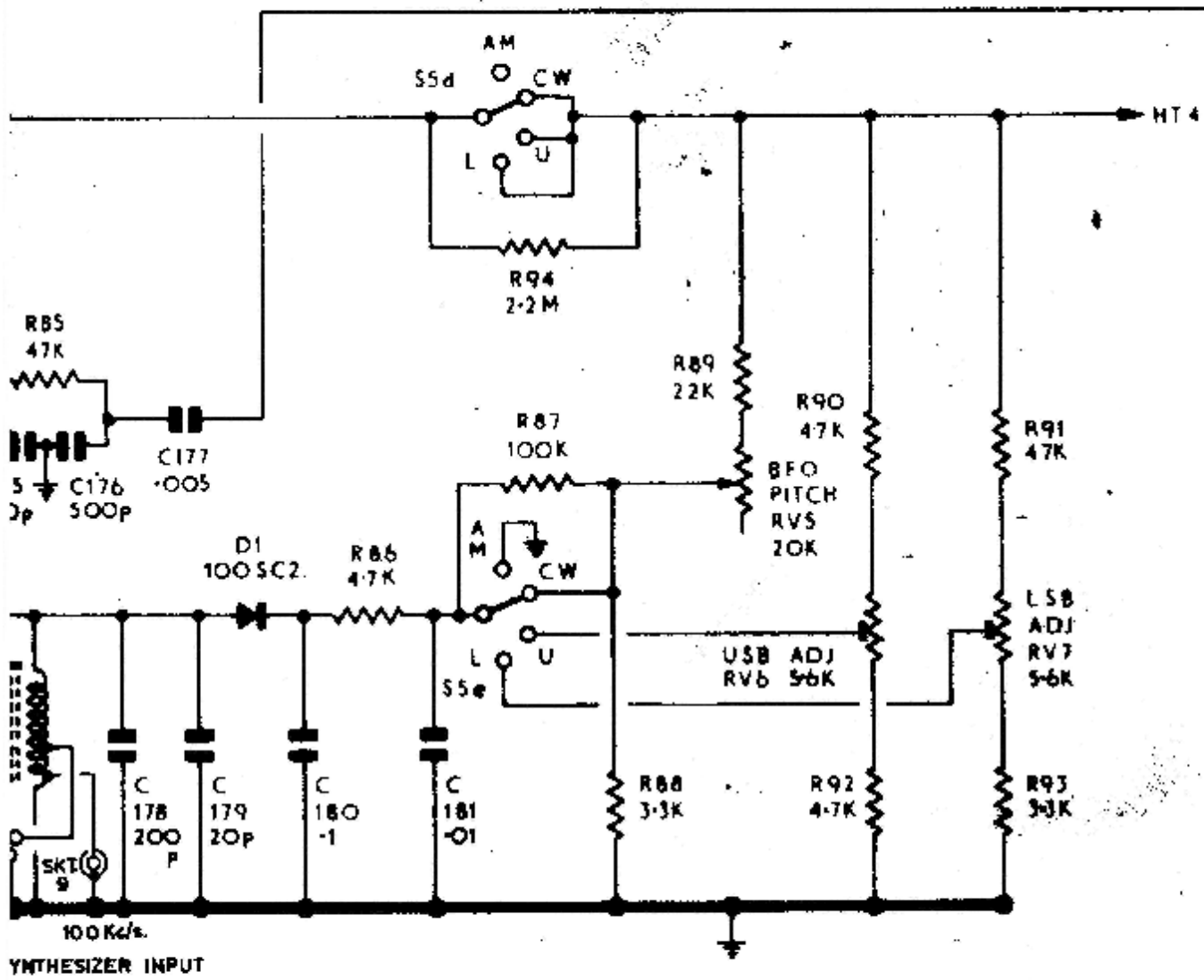


SYNTH

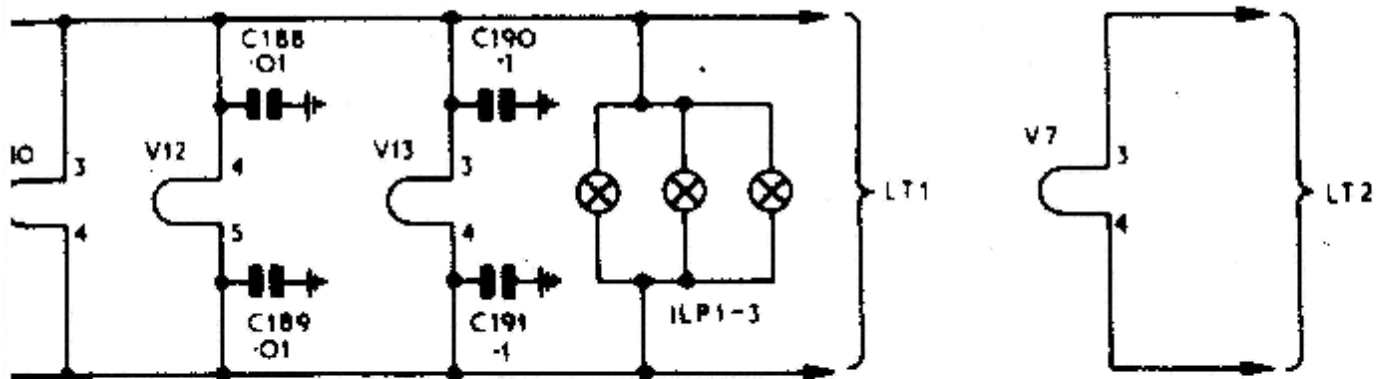


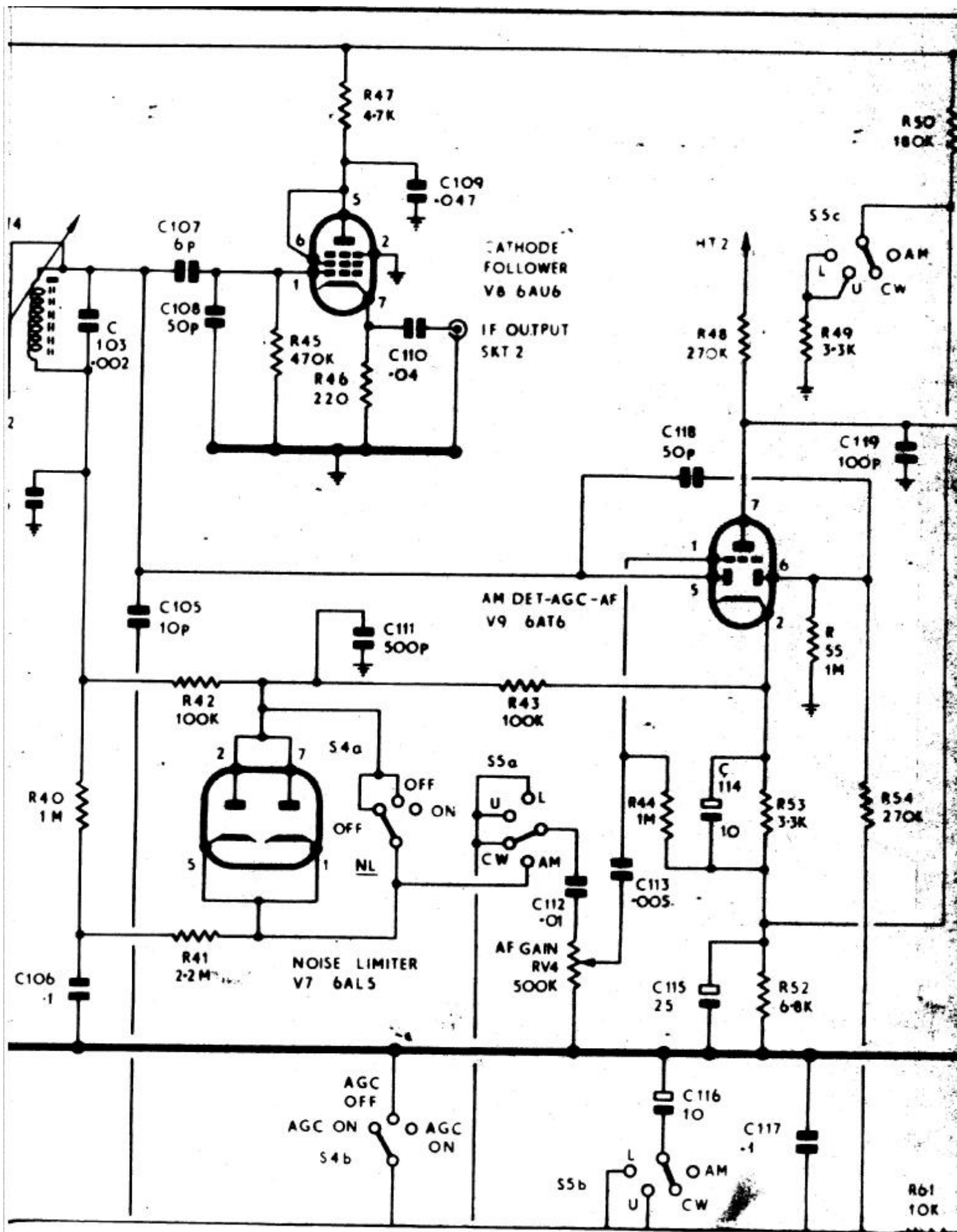




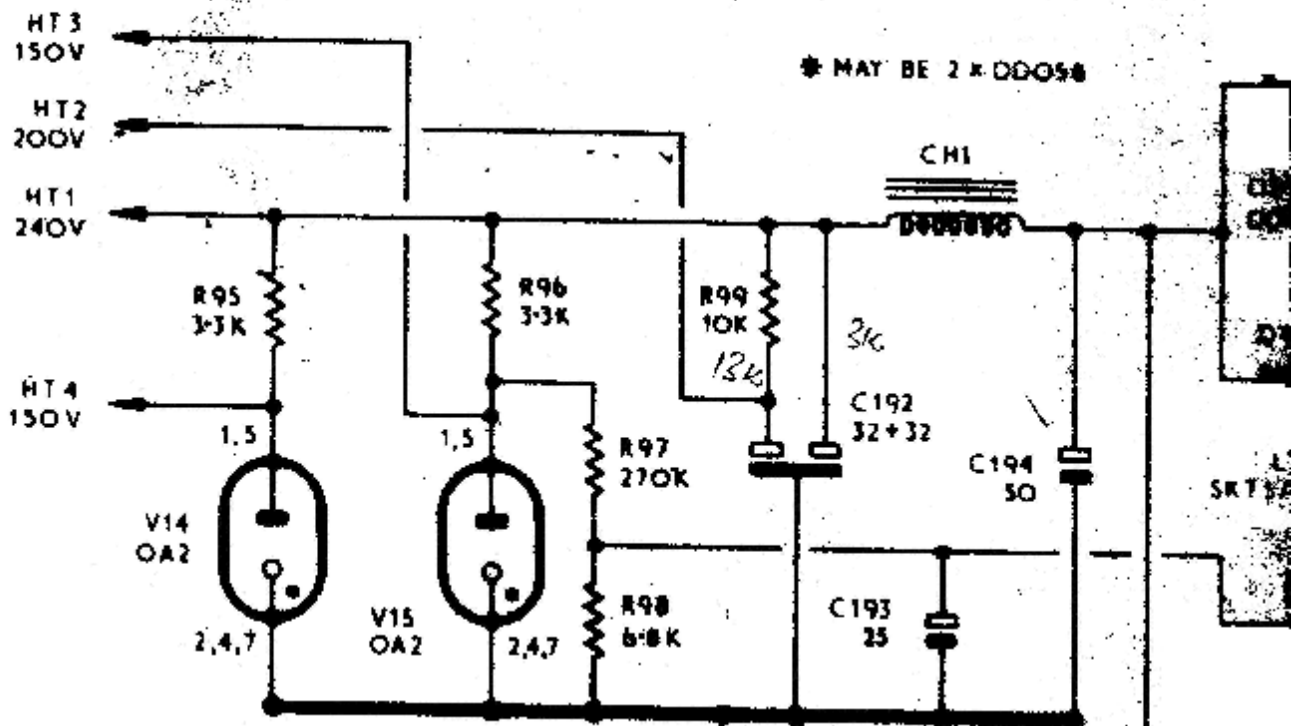


NOTE

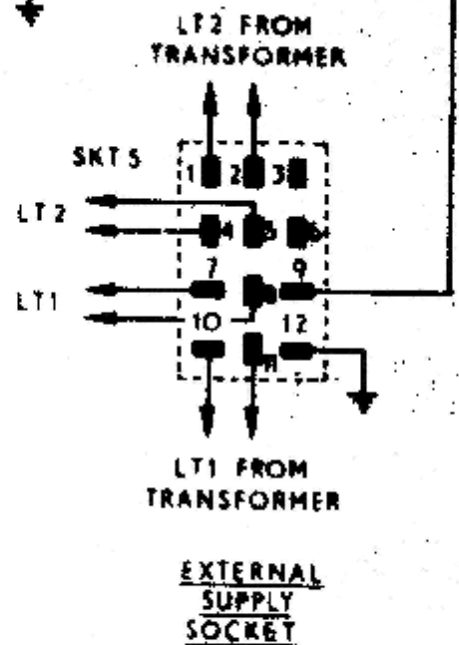
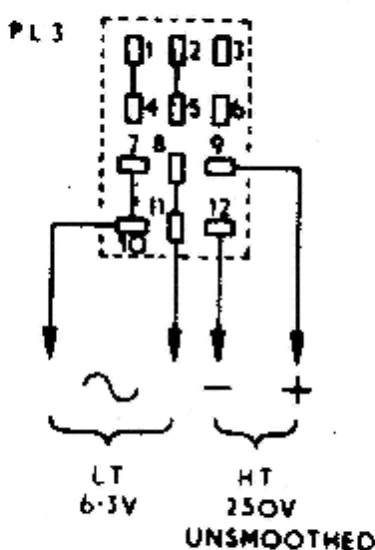
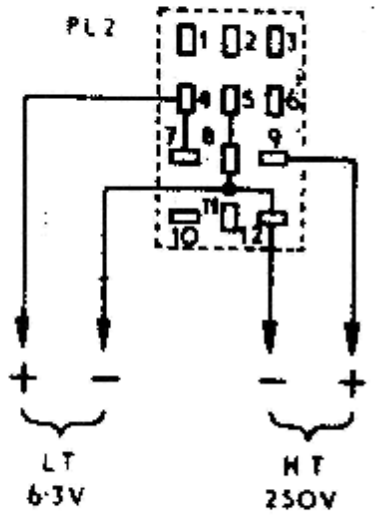




NOTE - T6 PRIMARY TAPS ARE SHOWN SET FOR MAIN OPERATION



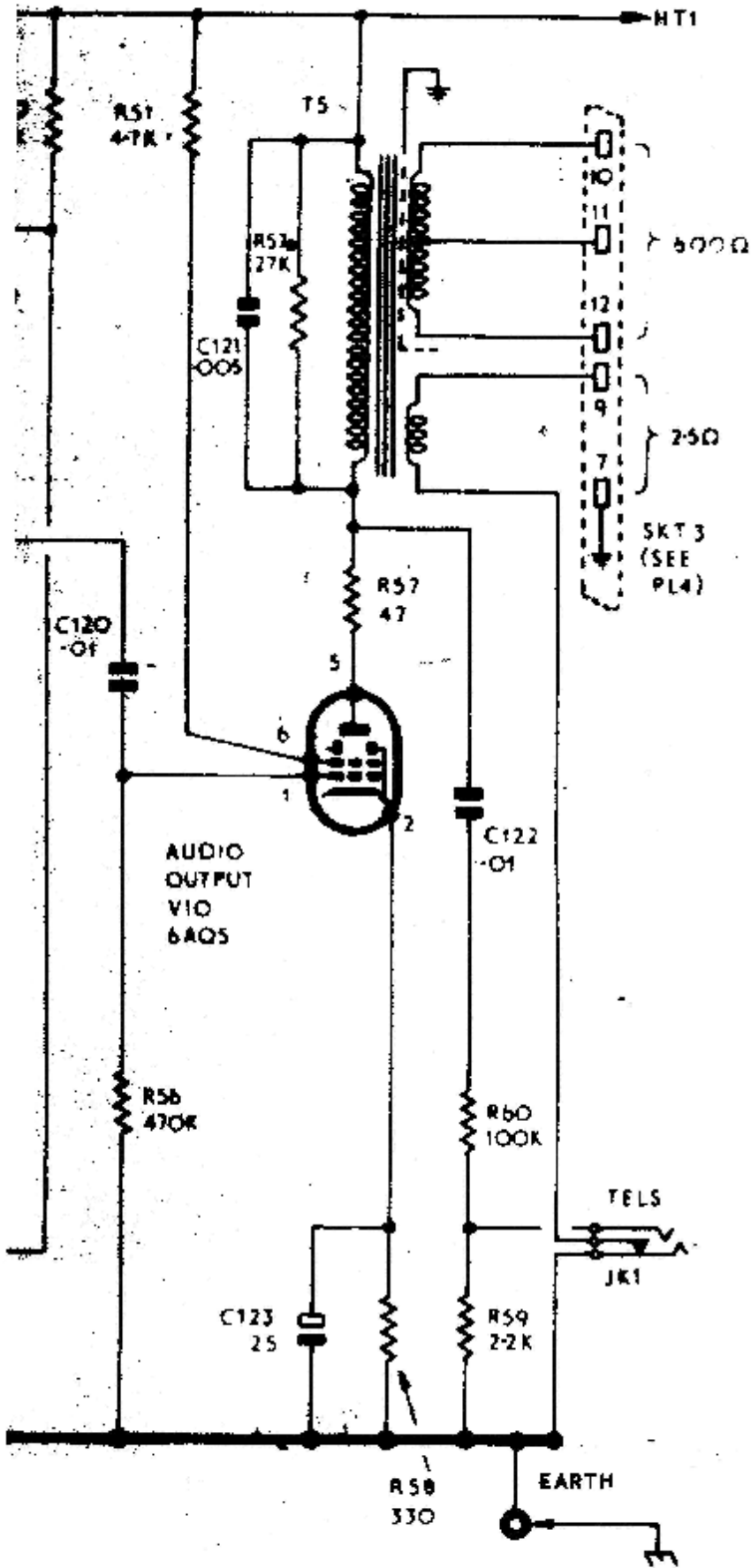
NOTE PL2 MATES WITH SKTS FOR OPERATION FROM EXTERNAL POWER SUPPLIES. PL3 MATES WITH SKT 5 FOR MAINS OPERATION. LINKS BETWEEN PINS 1&4, 2&5, 7&10 AND 8&11 COMPLETE LT SUPPLIES TO VALVE HEATERS

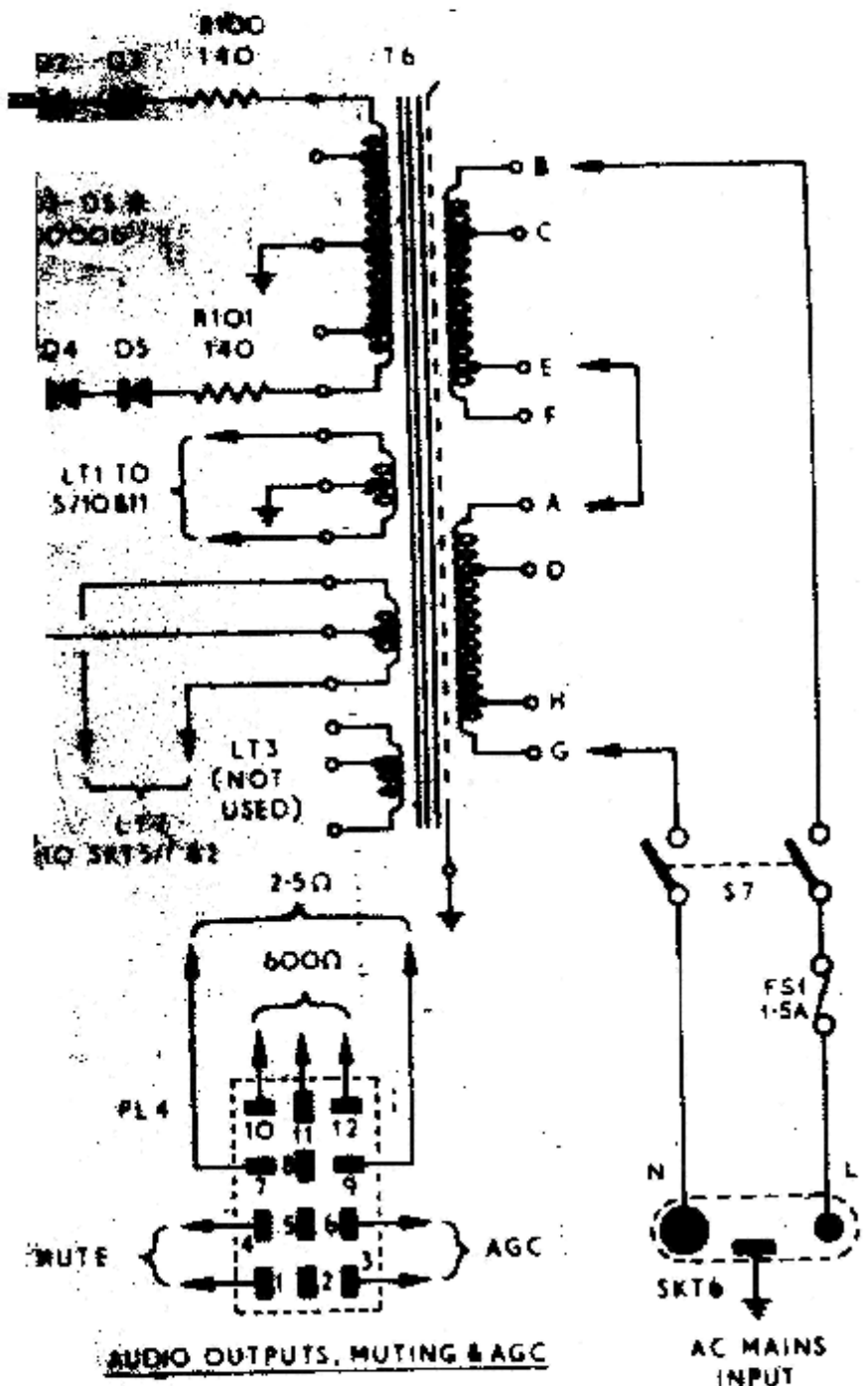


EXTERNAL POWER SUPPLIES

ACCESSORY SUPPLIES

NOTE MALE CONNECTORS ARE SHOWN THUS ■ AND FEMALE □ CHASSIS MOUNTED CONNECTORS ARE MARKED 'SKT'





**AUDIO OUTPUTS, MUTING & AGC**

**NOTE** PL4 MATES WITH SKT 3  
PINS 4, 6 & 7 ARE EARTHED  
WITHIN THE RECEIVER  
PINS 1 & 4 MUST BE LINKED  
WHEN THE MUTING FACILITY  
IS NOT IN USE

EDDYSTONE RADIO LTD  
BIRMINGHAM 31  
ENGLAND.

Wiring No. EP1211

DESIGNED BY	S. DENNICK
CHECKED BY	<i>[Signature]</i>
DATE	14.10.66



PRINTED IN ENGLAND