

EDDYSTONE MODEL EA12
HIGH STABILITY
AMATEUR BAND COMMUNICATIONS RECEIVER

The EDDYSTONE Model EA12 is a 13-valve double-conversion communications receiver for CW, AM and SSB reception on all amateur bands from 10 to 160 metres. Operation is from any standard AC mains supply or from low voltage DC with a suitable DC/AC converter.

A crystal controlled 'front-end' and tunable 1st IF provide high stability and a constant tuning rate at all frequencies in the tuning range. Calibration is linear and can be read to within one kilocycle when the scales are standardised against the built-in crystal calibrator. The IF tuning range is restricted to 600 kc/s to give adequate bandspread on the lower frequency bands and in consequence four separate ranges are used for complete coverage of the 10 metre band. Nine ranges cover the six amateur bands in the tuning range of the receiver.

The overall performance is sensibly constant for all frequencies and a bandpass-tuned RF amplifier of the cascode type ensures extremely good protection against cross-modulation and blocking. The signal frequency circuits are tuned by a separate control which takes the place of the more usual aerial trimmer. A 2-1 reduction drive makes for ease of adjustment.

Continuously variable selectivity is available at the low frequency 2nd IF together with a tunable slot filter and a crystal filter for CW reception. When taking SSB signals provision is made for positive selection of the correct bandwidth and the appropriate carrier insertion frequency, the latter being adjustable within fine limits by use of the BFO control. This has a 5-1 reduction drive and operates with a much reduced tuning swing when used in this mode.

A normal envelope detector and series diode noise limiter are used for AM reception and a product detector with double diode noise clipper for CW/SSB. A low-pass audio filter is permanently in circuit for CW/SSB reception but can be switched to become a sharply tuned filter when taking CW signals under conditions of severe adjacent channel interference.

Independent RF, IF and AF gain controls are provided and other controls include a combined AGC/noise limiter switch and a five-position mode switch ('AM' - 'CW' - 'CW with Audio Filter' - 'SSB Upper Sideband' - 'SSB Lower Sideband'). The receiver can be muted during transmission either by a switch on the panel or by suitable connection to an external switch or relay. A pre-set control is provided at the rear to allow the muting level to be adjusted to suit the power output of the associated transmitter.

Carrier level can be read from a large calibrated meter which is clearly marked in 'S' units 1-9, each corresponding to a 6dB increase in carrier level. Above 'S9' the meter is calibrated directly in dB. The meter is controlled by the AGC circuit and is disconnected when the AGC is switched off.

A five-inch loudspeaker is fitted internally and arrangements are made for connecting a larger external speaker unit should this be preferred. Telephones can be plugged into a socket on the panel, the circuit being arranged so that the speaker output is interrupted when telephones are in use. External FSK adaptors, panoramic display units etc. can be fed from a coaxial socket at the rear. The output is of low impedance at the 2nd IF (100 kc/s). (A panoramic display unit suitable for use with the EA12 is manufactured by Stratton & Co. under the Type No. EP20. It is styled to match the receiver and full details are available on request.)

The EA12 is suitable for continuous operation under adverse climatic conditions and is housed in a strong steel cabinet of convenient dimensions. High quality components are employed throughout and the unit is supplied complete with a full complement of eleven crystals.

Sole Manufacturers:- STRATTON & CO., LTD., ALVECHURCH RD., BIRMINGHAM, ENGLAND.
Tel. PRIory 2231/4. Cables 'Stratnoid' Birmingham. TELEX 33708.

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Frequency Coverage.

The receiver covers all amateur bands from 10-160 metres in nine ranges, four of these being used for the 10 metre band.

Range 1	..	29.4 - 30.0 Mc/s (10M).	Range 6	..	13.9 - 14.5 Mc/s (20M). 15.6
Range 2	..	28.9 - 29.5 Mc/s (10M).	Range 7	..	6.9 - 7.5 Mc/s (40M). 8.6
Range 3	..	28.4 - 29.0 Mc/s (10M).	Range 8	..	3.4 - 4.0 Mc/s (80M). 4.1
Range 4	..	27.9 - 28.5 Mc/s (10M).	Range 9	..	1.8 - 2.4 Mc/s (160M). 2.5
Range 5	..	20.9 - 21.5 Mc/s (15M).			

Intermediate Frequencies.

- 1st IF .. Tunable over the range 1.1 - 1.7 Mc/s. The local oscillator tracks on the 'low' side covering the band 1.0 - 1.6 Mc/s.
- 2nd IF .. 100 kc/s with crystal filter, slot filter and continuously variable selectivity. The BFO provides a swing of ± 3.5 kc/s in the CW positions and ± 100 c/s at SSB.

Valve Complement.

The double conversion circuit employs a total of 13 valves together with five silicon diodes, two of which are used as rectifiers in the power supply.

Ref	Type	Circuit Function
V1	ECC189 or 6ES8 (CV5331)	RF Amplifier.
V2	ECH81 or 6AJ8 (CV2128)	1st Mixer and 1st Osc. Amp./Dblr.
V3	EC90 or 6C4 (CV135)	1st Oscillator (crystal controlled).
V4	ECH81 or 6AJ8 (CV2128)	2nd Mixer and 2nd Osc. Isolation Amp.
V5	EC90 or 6C4 (CV135)	2nd Oscillator (VFO).
V6	EF93 or 6BA6 (CV454)	1st 100 kc/s IF Amplifier.
V7	EF93 or 6BA6 (CV454)	2nd 100 kc/s IF Amplifier.
V8	EB91 or 6AL5 (CV140)	AM Detector and AGC Rectifier.
V9	ECC83 or 12AX7 (CV492)	Cathode Follower and Audio Amplifier.
V10	EK90 or 6BE6 (CV453)	CW/SSB Detector.
V11	EL90 or 6AQ5 (CV1862)	Audio Output.
V12	150C2 or OA2 (CV1832)	HT Stabiliser.
V13	EF94 or 6AU6 (CV2524)	Crystal Calibrator.
D1	DD006 - -	AM Noise Limiter.
D2/3	DD006 - -	CW/SSB Noise Clipper.
D4/5	DD058 - -	HT Rectifier.

Input and Output Impedances.

- Aerial Input .. 75 Ω unbalanced (coaxial socket).
- IF Output .. 250 Ω (nominal) unbalanced to coaxial socket. Suitable for terminating impedances in the range 75-300 Ω .
- Audio Output .. Loudspeaker : 3 Ω (internal or external).
Telephones : Nominally 2,000 Ω but suitable for use with telephones of most standard impedances.

Power Supply.

Single-phase AC mains 100/125V and 200/250V (40-60 c/s). Consumption : 85VA.
Mains input is to a socket at the rear and the live line is fused at 1.5 Amps.

Sensitivity.

AM sensitivity with an IF bandwidth of 6 kc/s is 2 μ V for a 10dB s/n ratio. On CW the sensitivity is 0.5 μ V for a 20dB s/n ratio with an IF bandwidth of 1.3 kc/s.

Image Rejection.

Better than 50dB at the highest frequency under the worst condition of the 1st IF tuning.

IF Breakthrough.

Breakthrough at the 1st IF is greater than 90dB down at 2 Mc/s on Range 9 and greater than 100dB down at all other frequencies. Breakthrough at the 2nd IF is greater than 110dB down on all ranges.

IF Selectivity.

The overall bandwidth at 6dB down is continuously variable within the limits 1.3 kc/s to 6, kc/s and is narrowed to 50 c/s when using the 100 kc/s crystal filter.

The 'T' notch filter provides a steep-sided rejection notch, tunable across the IF passband. Notch depth is of the order 40dB and the filter in addition to its use in rejecting heterodyne interference can also be used to steepen the carrier side of the passband when taking SSB signals.

Markings on the selectivity control indicate the appropriate settings for the different signal modes. Typical overall bandwidths are as follows.

Position	-6dB	-50dB
CRYSTAL (N)	50 c/s	2 kc/s
CW	1.3 kc/s	5 kc/s
SSB	3 kc/s	8 kc/s
AM	6 kc/s	12 kc/s

Calibration and Re-setting Accuracy.

Scale accuracy is of the order 0.5% when the cursor adjuster is set so that the cursor is at its mid-travel position. Frequencies can be set to within one kilocycle when the scales are standardised against the built-in 100 kc/s crystal calibrator.

Frequency Stability.

Drift does not exceed 100 c/s in any one hour period. The thermal inertia of the receiver is high and short-term drift is not greater than 20 c/s for temperature changes of up to 20°C.

A variation of $\pm 10\%$ in the applied mains voltage does not affect the tune frequency by more than 100 c/s.

AGC Characteristic.

The audio output level does not change by more than 9dB when the carrier level is increased 90dB above 5 μ V. (Taken at 7 Mc/s with an IF bandwidth of 3 kc/s.)

Two AGC time constants are provided and the AGC delay is automatically reduced when taking SSB signals.

Audio Output and Response.

The maximum audio output is 2.5 watts to a standard 3 Ω loudspeaker. An output of 1 watt is available at 5% distortion.

The audio response on AM is level within 3dB over the range 400 c/s to 7 kc/s. On CW, a low-pass filter modifies the response such that at 200 c/s and 3 kc/s the output is 30dB down relative to that at 1,000 c/s. The filter termination is changed in the SSB positions to give a response which is less than 10dB down at 500 c/s and more than 30dB down at 5 kc/s.

The CW filter provides 6dB and 20dB bandwidths of 200 c/s and 1,000 c/s.

IF Output.

An input of 2 μ V at the aerial socket will produce an output of 100mV across a terminating resistor of 75 Ω . (AGC off, gains at max and IF bandwidth at 3 kc/s.)

Dimensions and Weight.

Width . . .	16 $\frac{3}{4}$ " (42.5 cm.).	Depth . . .	13 $\frac{1}{2}$ " (34.6 cm.).
Height . . .	8 $\frac{3}{4}$ " (22.2 cm.).	Weight . . .	47 lb. (21.3 kg.).

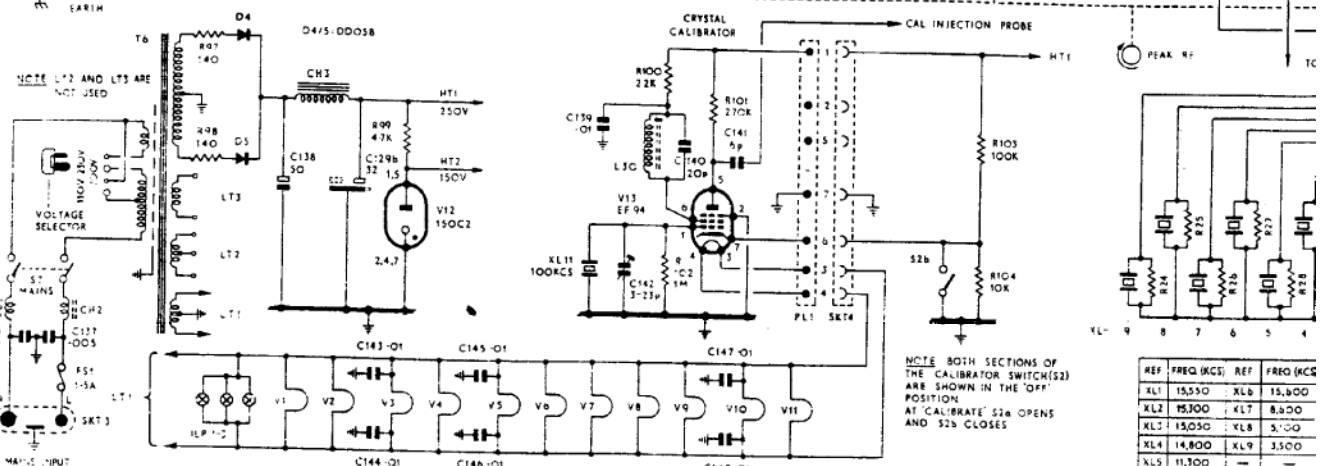
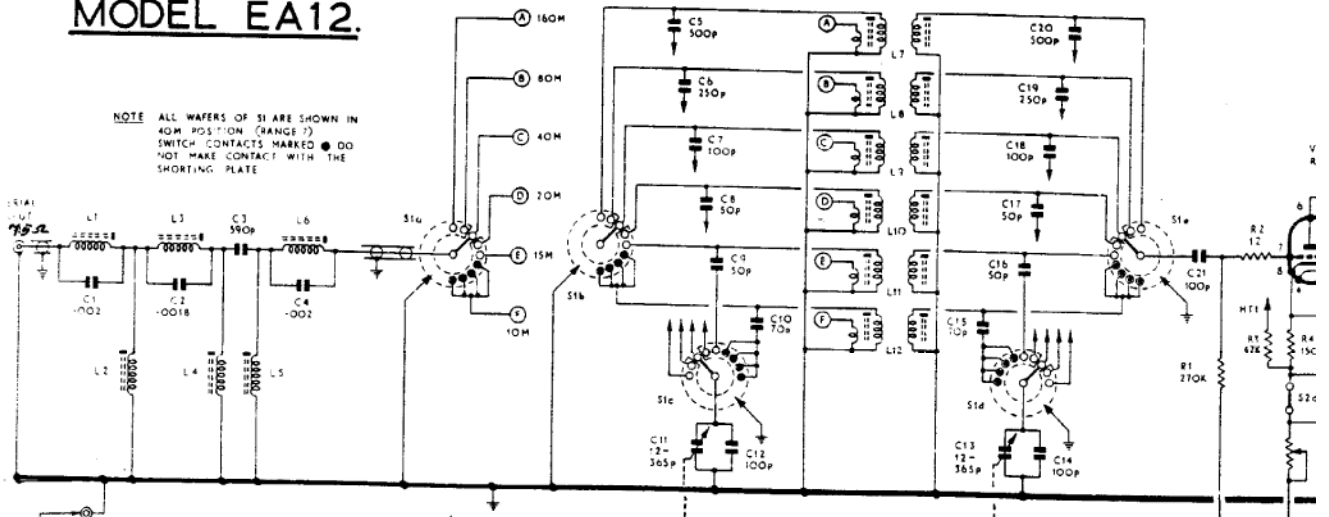
Mounting.

The receiver is normally supplied for surface-mounting but can be adapted for mounting in a standard 19" rack.

In the interests of continued improvement, we reserve the right to amend this specification without notice.

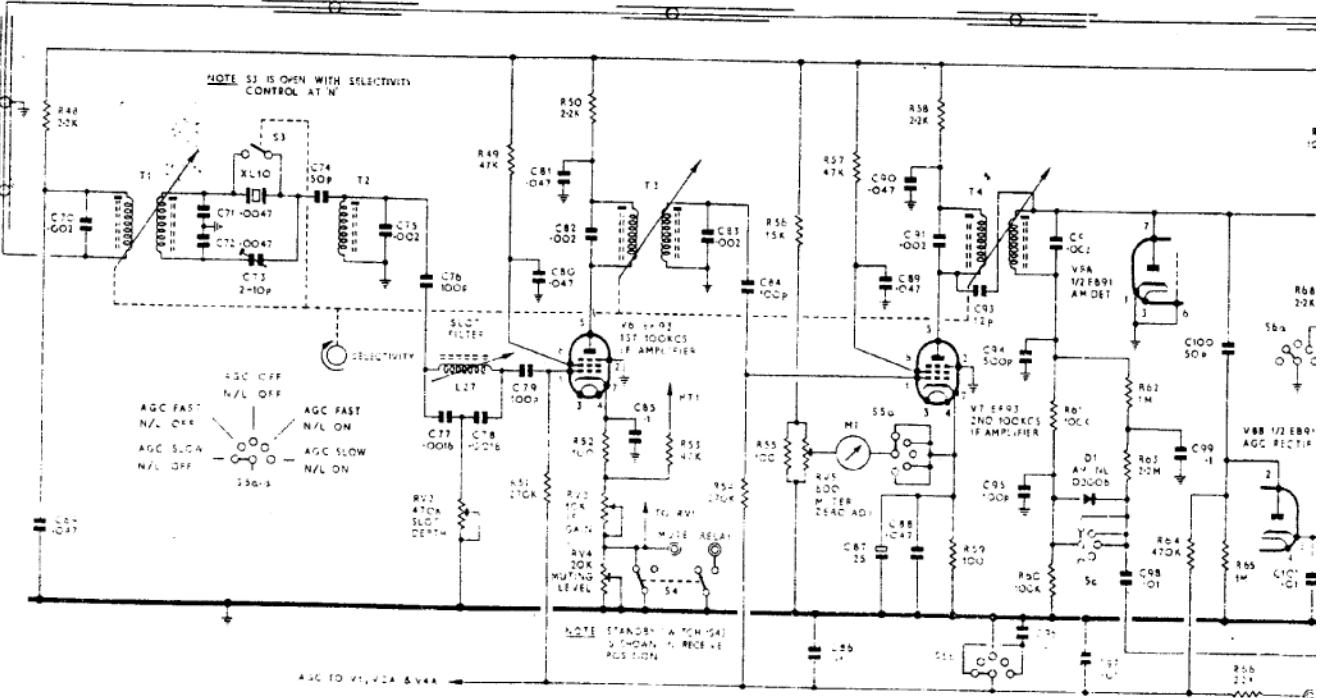
EDDYSTONE MODEL EA12.

NOTE ALL WAFERS OF S1 ARE SHOWN IN 40M POSITION (ORANGE ?) SWITCH CONTACTS MARKED ● DO NOT MAKE CONTACT WITH THE SHORTING PLATE



REF	FREQ (KCS)	REF	FREQ (KCS)
XL1	15,550	XL6	15,500
XL2	15,300	XL7	8,500
XL3	15,050	XL8	5,500
XL4	14,800	XL9	3,500
XL5	11,700		

NOTE BOTH SECTIONS OF THE CALIBRATOR SWITCH(S2) ARE SHOWN IN THE 'OFF' POSITION AT 'CALIBRATE' S2a OPENS AND S2b CLOSSES



NOTE S3 IS OPEN WITH SELECTIVITY CONTROL AT 'W'

AGC FAST N/L OFF
AGC SLOW N/L OFF
AGC FAST N/L ON
AGC SLOW N/L ON

NOTE STANDBY SWITCH (S4) IS CHANGED TO RECEIVE AGC SIGNAL

AGC TO V1, V2A & V4A

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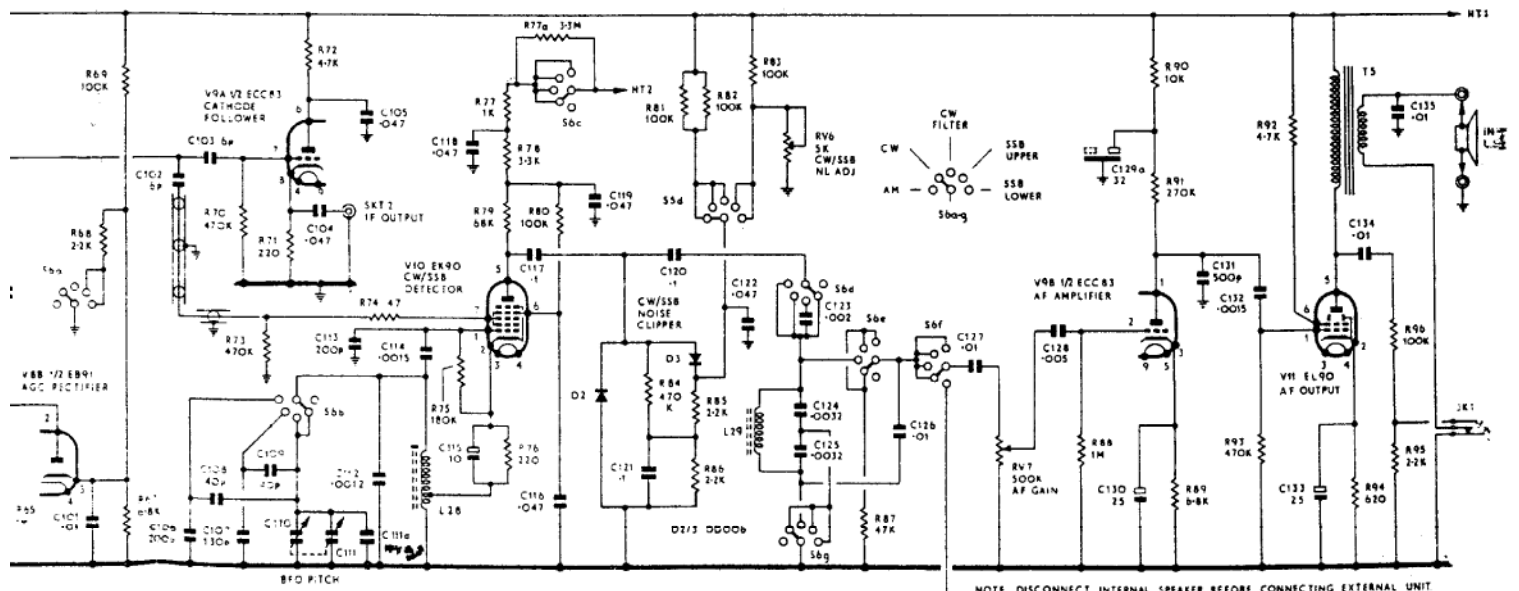
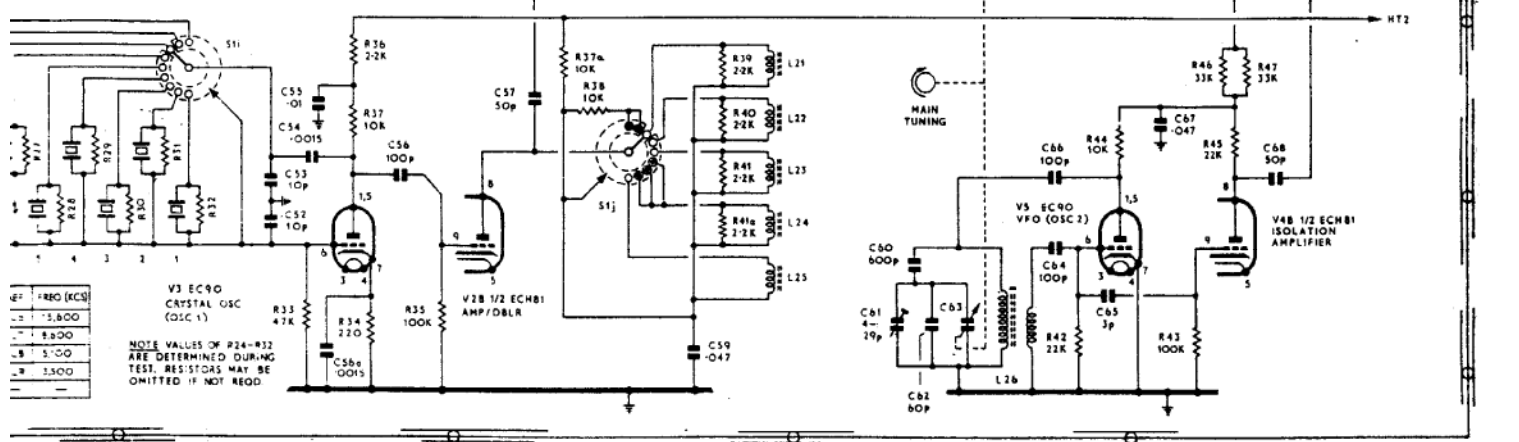
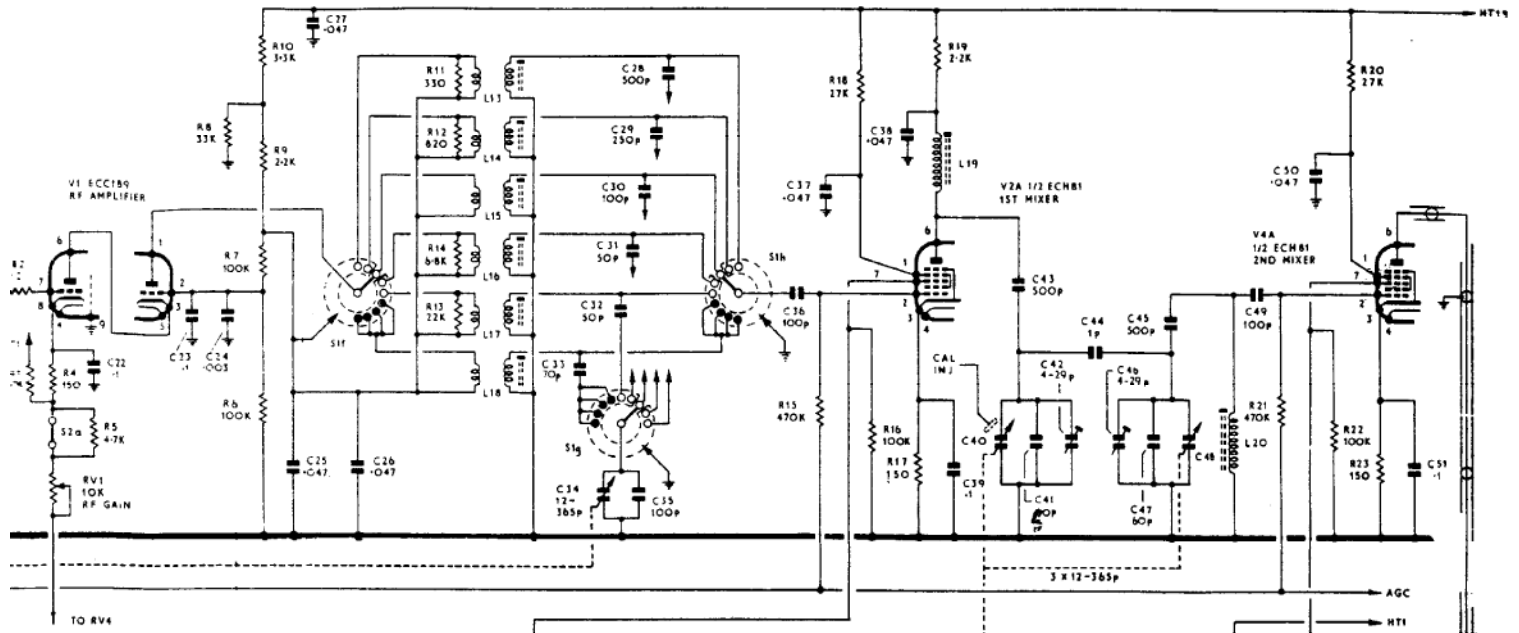
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NOTE: COMBINED VALUE OF C107/C111 17-253μ

C77 and C78 may be 1500pf.