

Til repræsentanter og forhandlere.

18/78/LT/jr

29. juni 1978

Ang.: Ny 4m sender mixer.

I fremtiden vil vore 4m apparater i AP 2000 serien blive leveret med sender mixer modul C 15A, og det tidligere modul B 28C vil udgå. Det nye modul C 15A kan umiddelbart erstatte B 28C ved eventuel udskiftning i eksisterende apparater.

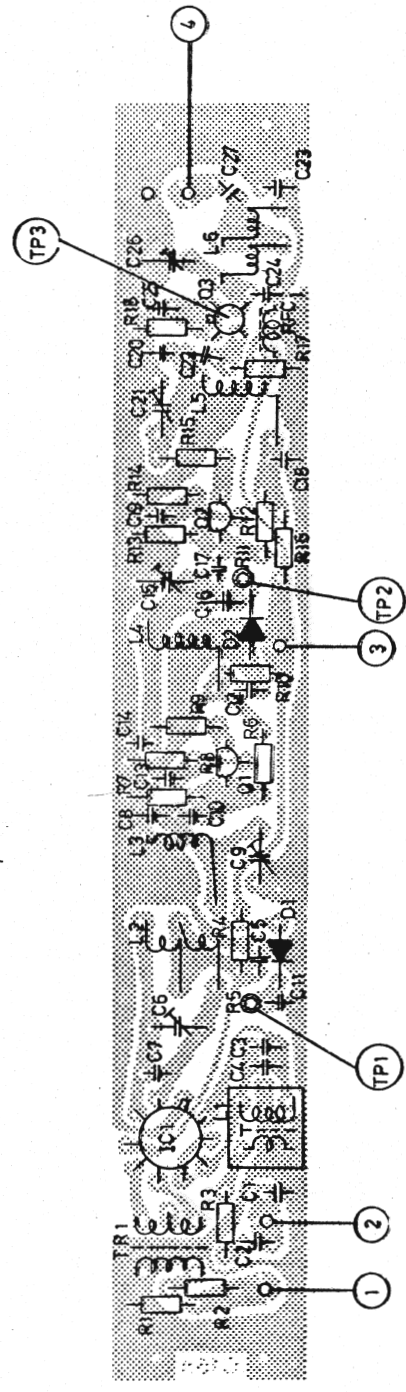
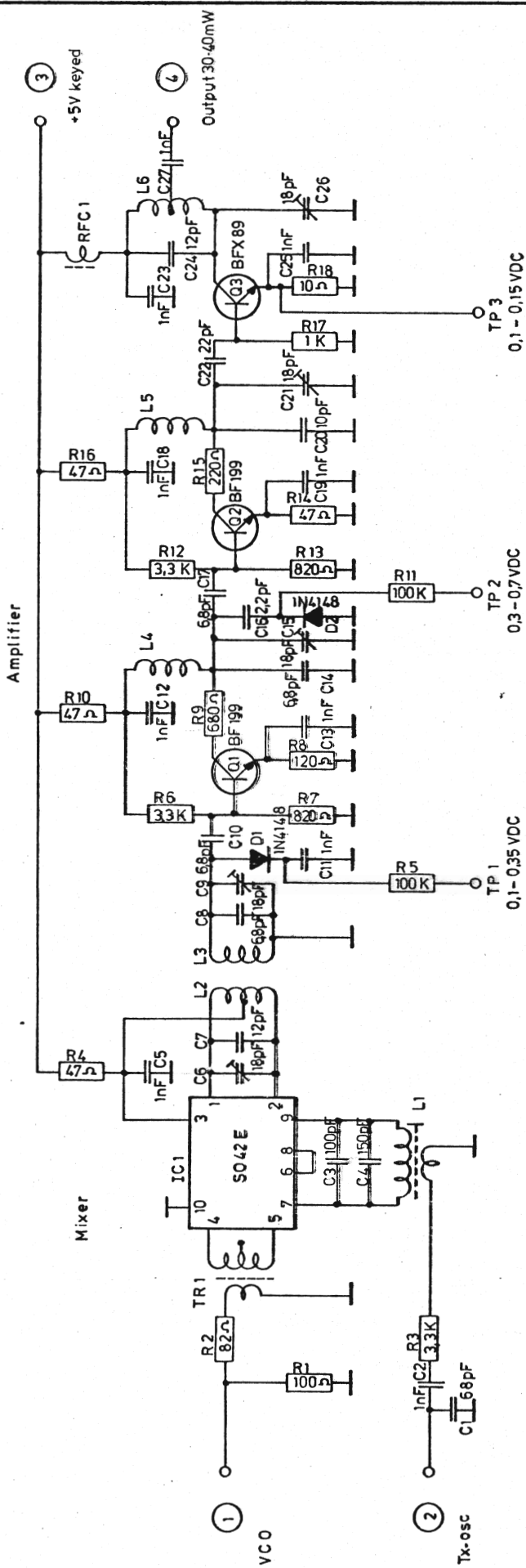
Fordelen ved det nye modul er blandt andet, at uønskede sidebånd på senderen er dæmpet kraftigere. Dette giver mulighed for at have en modtagerfrekvens, som er lavere end senderfrekvensen. Modtagerfrekvensen må dog ikke ligge mere end 10 mhz lavere end senderfrekvensen. Dette svarer til et sender mixer krystal på 5,7 Mhz. Sender mixer krystallet beregnes efter den sædvanlige formel $F_{TX \text{ mix.}} = 10,7 + (F_{RX} - F_{TX})/2$.

Med venlig hilsen
ap radiotelefon a/s

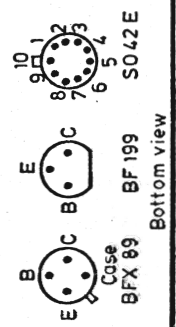
Lars Tuxen

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Bilag: Diagram : 78031-3E2
Beskrivelse : 77288-4E2 side 3
Trimmevejl : 77290-4E2 side 3



TX X-tal range	Tuning capacitor
11.3 - 14.8 MHz	Remove C4
8.8 - 11.3 MHz	Remove C3
7 - 8.8 MHz	Use both C3 and C4
5.5 - 7 MHz	Remove C3 and C4, and replace with 390pF



Bottom view

Rettet:	Transmitter mixer and amplifier 4m Print board C15 A1	Tegn.: 8-3-78 H.J.	Kontr.: J.H.
		Stykt nr.:	
	AP-RADIOTELEFON	Tegn. nr.:	78031-3E 2

electronic attenuator regulated by the diode current. This circuit is also used for external AF-blocking and squelch. An integrated AF output amplifier is used for the 3 W loud-speaker output and here the feedback-capacitors C 6 and C 7 produce the deemphasis.

For the handset earpiece Q 4 and Q 5 makes an amplifier while D 15 is blocking. The squelch circuit consists of an 8 kc tuned amplifier Q 3 followed by a detector D 11 and D 12. With increasing noise level on the AF-input the voltage on the negative side on C 19 will decrease from + 5 V. Getting lower than the squelch reg. voltage on point 7, the amplifier IC 2 switches over to an output voltage of + 5 V and thus blocking the AF-output through the volume control circuit.

In the key control circuit Q 1 and Q 2 goes ON when button in the handset connects point 11 to chassis, thus producing + 12 V on point 14. A positive voltage applied on point 10 will inhibit this function.

TRANSMITTER (Fig. 2)

Transmitter mixer and amplifier (75131-4E2)

Because the VCO has a frequency 21,4 MHz higher than the operating Rx-frequency, this signal is fed to the transmitter mixer and converted to the desired transmitting frequency. For simplex operation the necessary 21,4 MHz signal comes from a combined crystal oscillator/doubler. Thus the crystal will be 10,7 MHz. For good suppression of VCO - and 21,4 MHz injection the Tx-mixer is an integrated circuit IC1, which is balanced on both inputs. Amplifier stages Q 1, Q 2 and Q 3 give further suppression of unwanted sidebands and the necessary amplification to reach an output level of approx. 35 mW.

6 W power amplifier (75146-4E2)

The 6 W power amplifier consists of two stages Q 1 and Q 2 where the output level can be regulated by varying the supply voltage for Q 1.

15 W PA-stage (77289-4E2)

The output from the 15 W PA-stage goes through a forward power-

3. Tuning of the transmitter

A. Transmitter mixer and amplifier (print board C 15)

In the first place, remove C 3 if TX x-tal frequency is in the range 8,8 - 11,3 MHz, or C 4 if it is in the range 11,3 - 14,8 MHz. In the extreme case that x-tal frequency is below 7 MHz, replace both C 3 and C 4 with a 390 pF ceramic capacitor (f.ex. Miniwatt no. 2222 632 70391).

Key the transmitter and tune L 1 to max. DC-voltage on TP 1. It may be necessary to pre-adjust C 6 and C 9 in order to get enough signal to the diode. For example, pre-adjust C 6 and C 9 to near full capacitance for lower band Tx-frequencies, and to near minimum capacitance for higher band Tx-frequencies. When the signal on TP 1 is visible on the DC-voltmeter (internal resistance more than 10 M Ω), tune L 1, C 6 and C 9 to maximum (0,1-0,35V).

Connect the voltmeter to TP 2 and tune C 15 to max. reading (0,3-0,7 V).

Connect the voltmeter to TP 3 (can of Q 3 = emitter), and tune C 21 to max. reading (0,1-0,15V).

Connect a 50 Ω wattmeter to the output, and tune C 24 to maximum output power, which should be approximately 35 mW.

NB: Do not try to adjust C 6 and C 9 for maximum output power, because the signal is compressed in the last stage.

B. 6 W PA-stage (print board B 29)

Connect a wattmeter (50 Ω , 10-50 W to the test installation output and set the supply voltage to 12,0 V. Now tune all the trimmers in the PA-stage to maximum output power and finish with a fine adjustment of C 11 on the transmitter amplifier print B 28. Check the output power on the lowest and highest channel.

If may be necessary to remove C 14 at high frequencies.