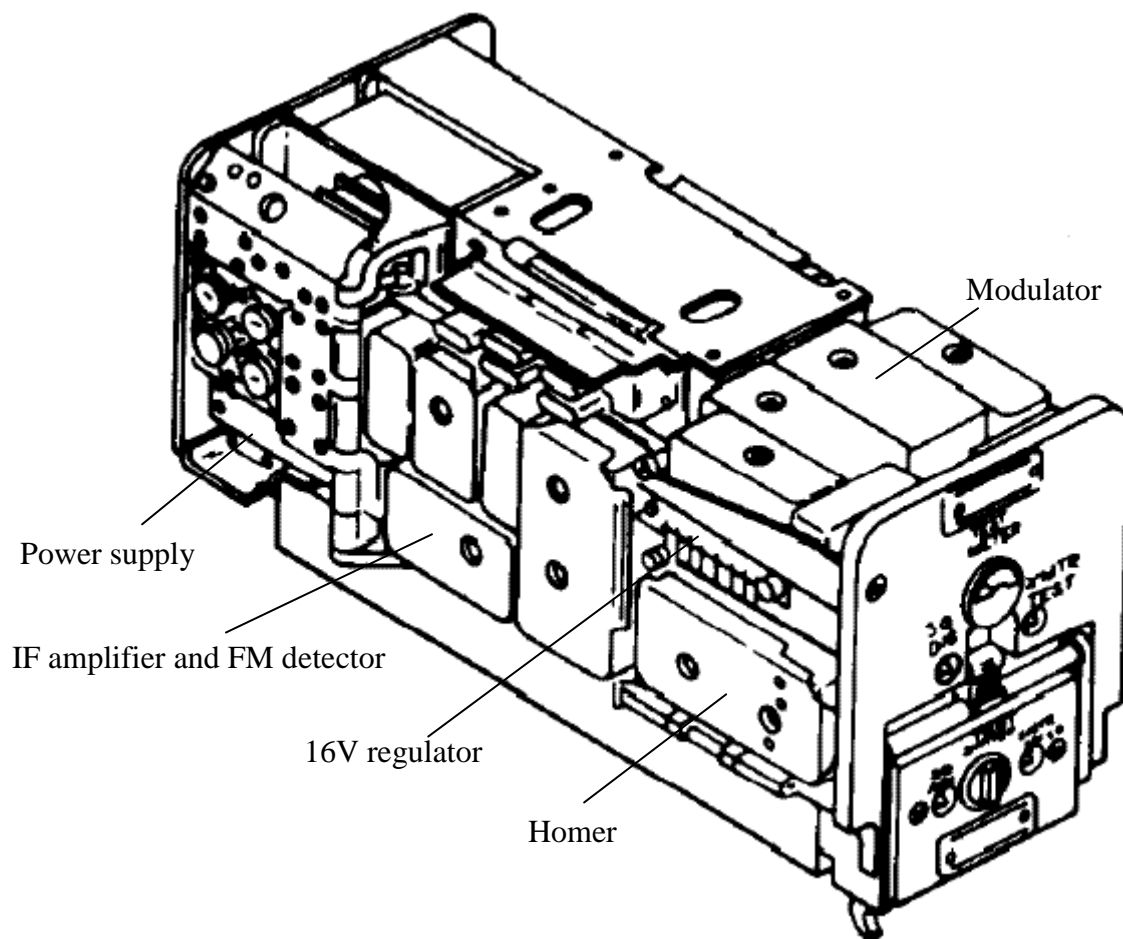
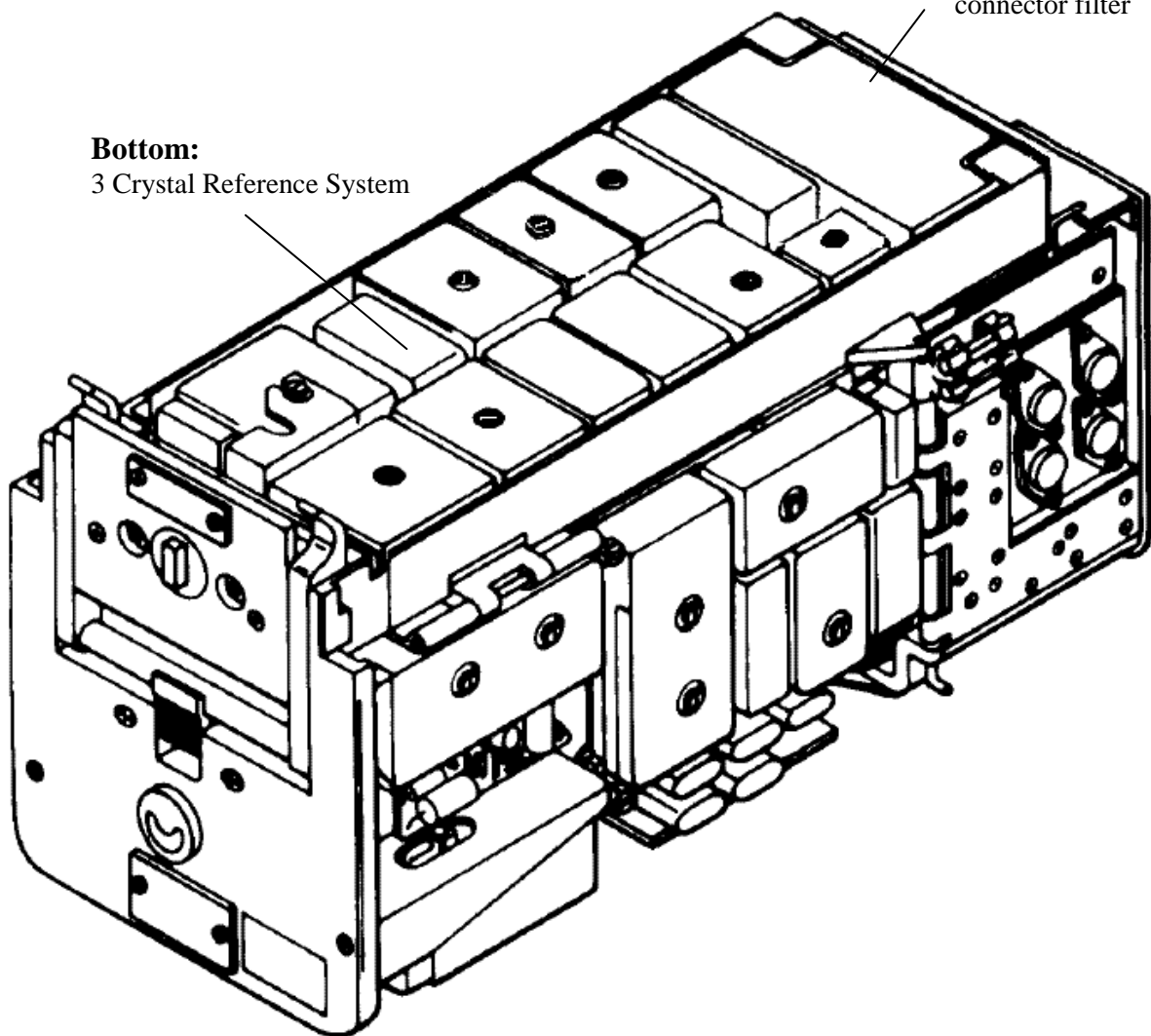
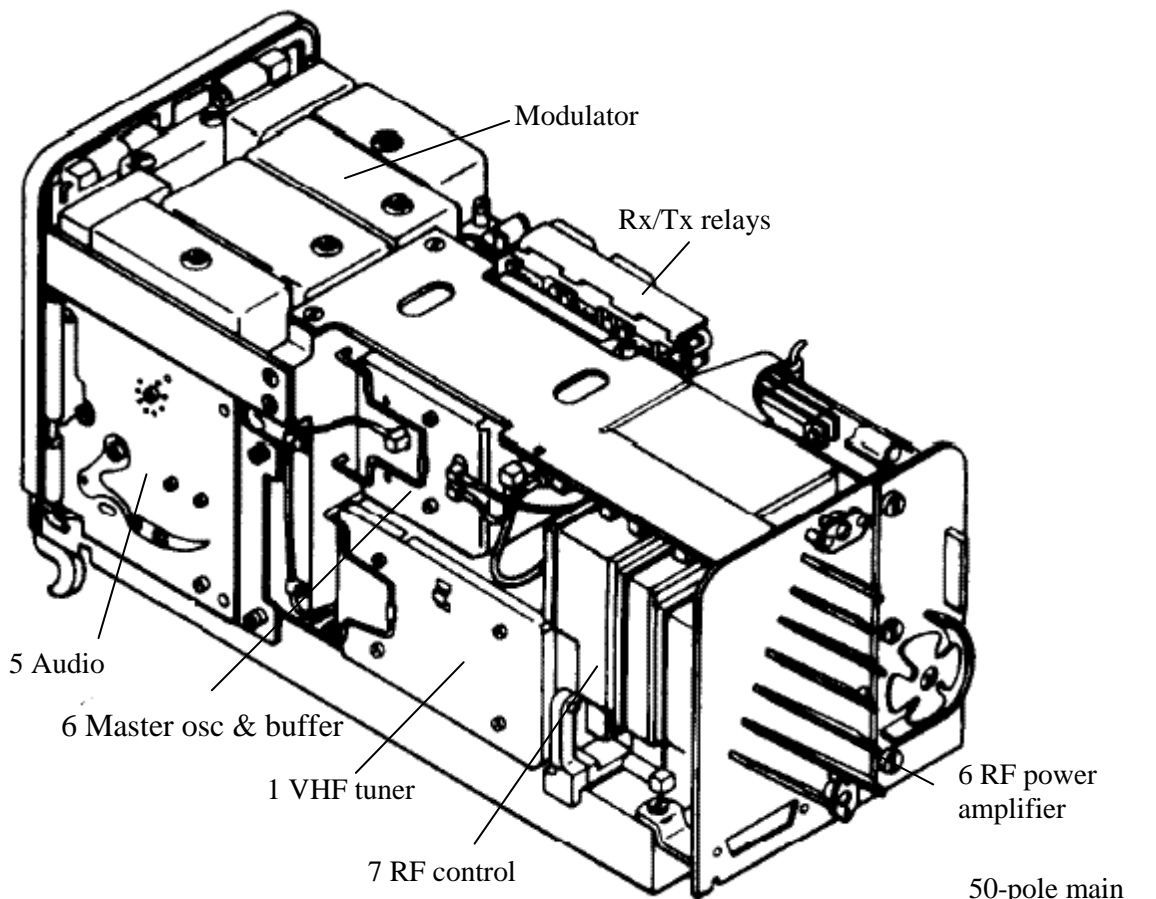


ARC-131 Circuit Diagrams

- 1 VHF tuner
- 2 Reference oscillators
- 3 Crystal Reference System (CRS)
- 4 IF amplifier and Homing circuits
- 5 Audio circuits
- 6 Transmitter circuits
- 7 RF switches
- 8 Modulator
- 9 Power supply and mechanical tuning



Left side and top modules



The AN/ARC-131

The ARC-131 was made by Magnavox around 1969 as the successor of the Collins ARC-54. Magnavox used many of the modules of its vehicular transceiver VRC-12 with the same frequency range and (FM) modulation. The land-based roots are visible - weight and size are 20% higher than in the ARC-54, and homing was a later addition.

“The AN/VRC-12 and AN/VRC-43 through VRC-49 is a series of combat-proven vehicular radio sets. The equipment provides 920 VHF/FM voice channels in the 30-76 MHz range. It consists of three major units: Receiver-Transmitter RT-246A/ VRC with a channel-presetting capability (10 pushbuttons), Manual Receiver-Transmitter RT-524A/ VRC with built-in loudspeaker, and Auxiliary Receiver R-442A/VRC. “

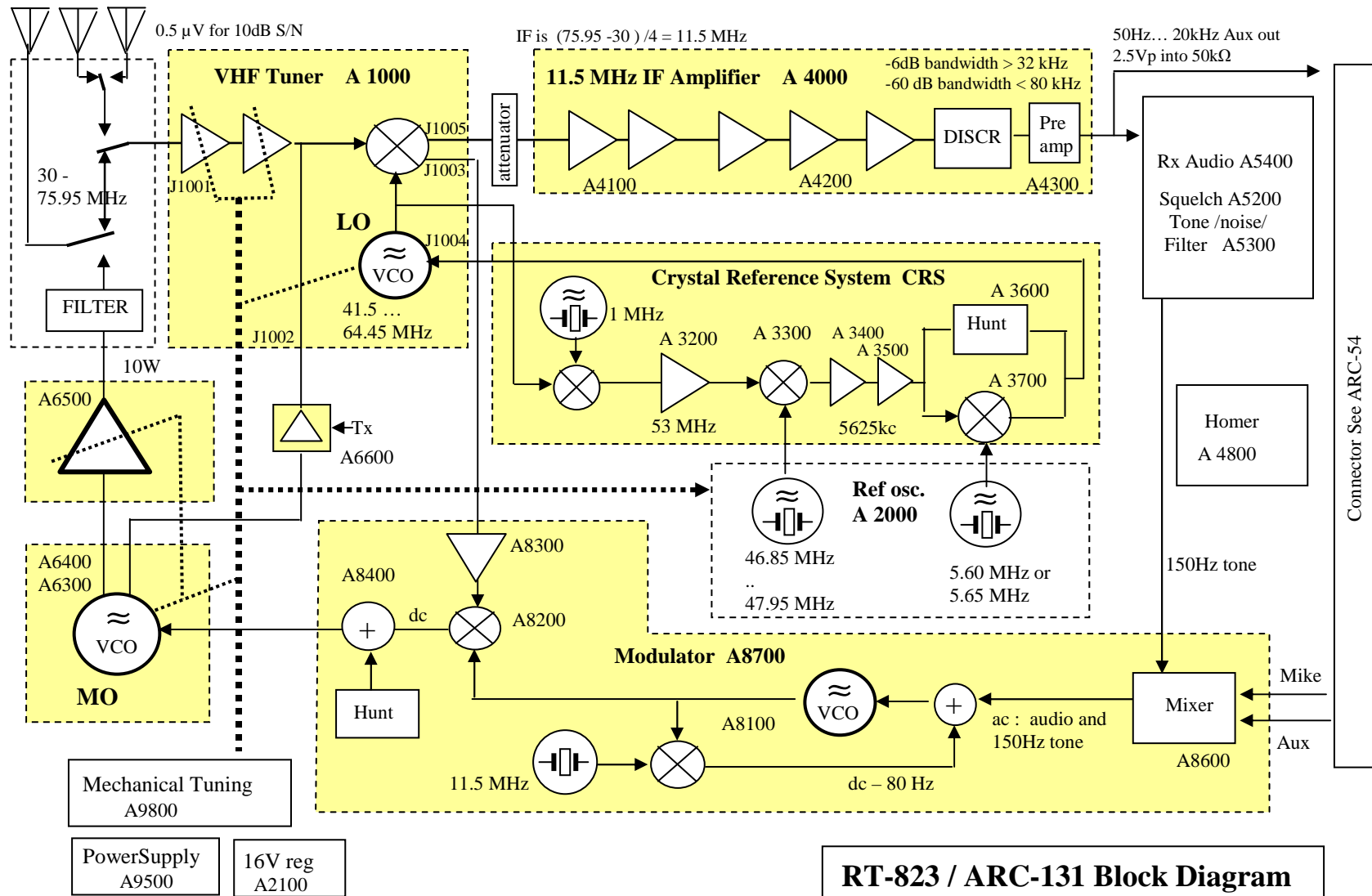
Compared to the ARC-54, the ARC131 has:

Same

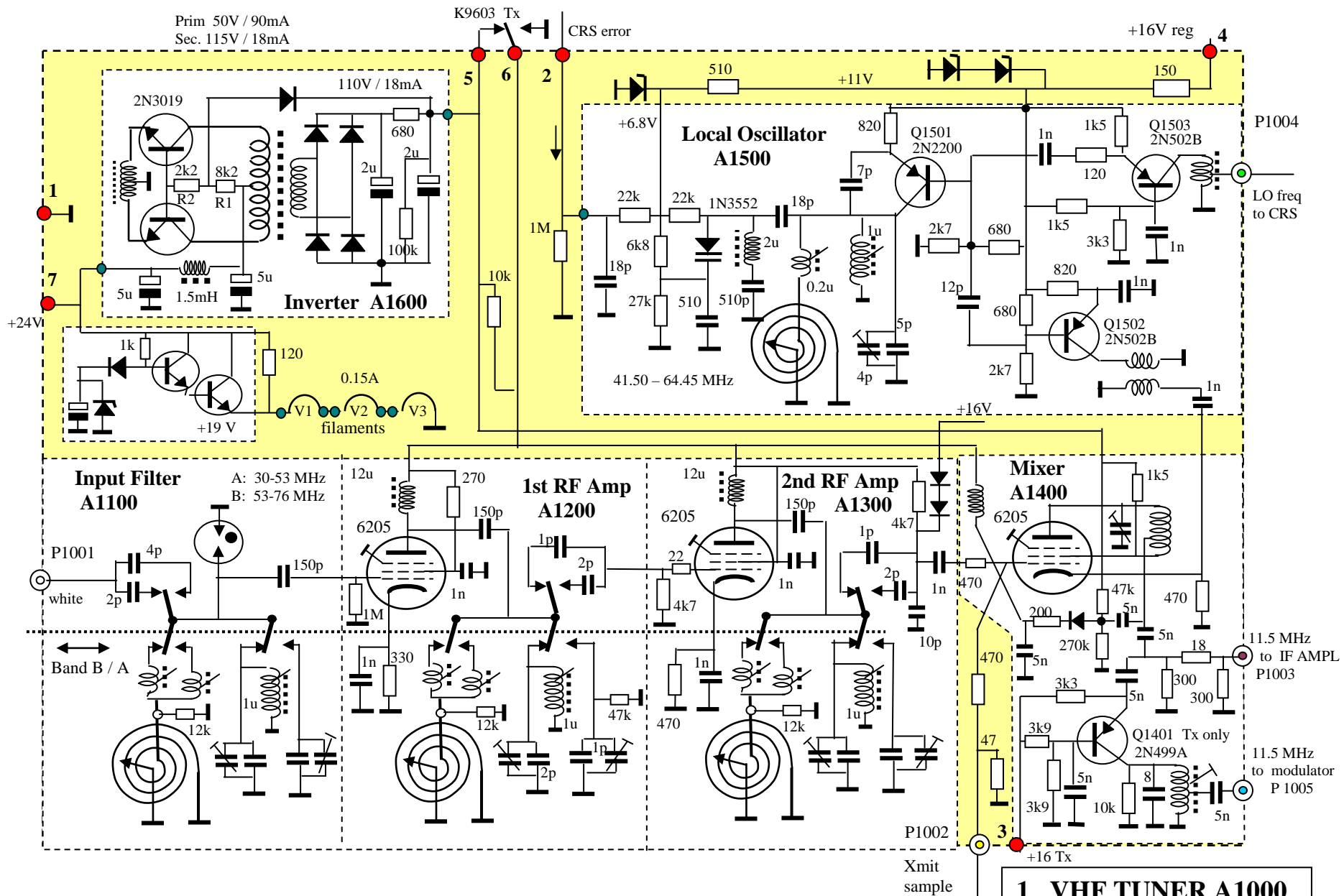
- The same plug and pinout;
- The same modulation (8kHz deviation FM)
- The same squelch modes (squelch based on 150Hz tone, 7.3kHz noise or disabled)
- Slightly more channels (920 versus 800, both with 50 kHz spacing)
- Retransmit capability is the same
- Both are mainly solid state with only 3 tubes. The ARC-131 has 3 tubes in the RF receiver input stages, the ARC-54 has 3 tubes in the transmitter RF stages.

Differences are mainly in the internal realisation:

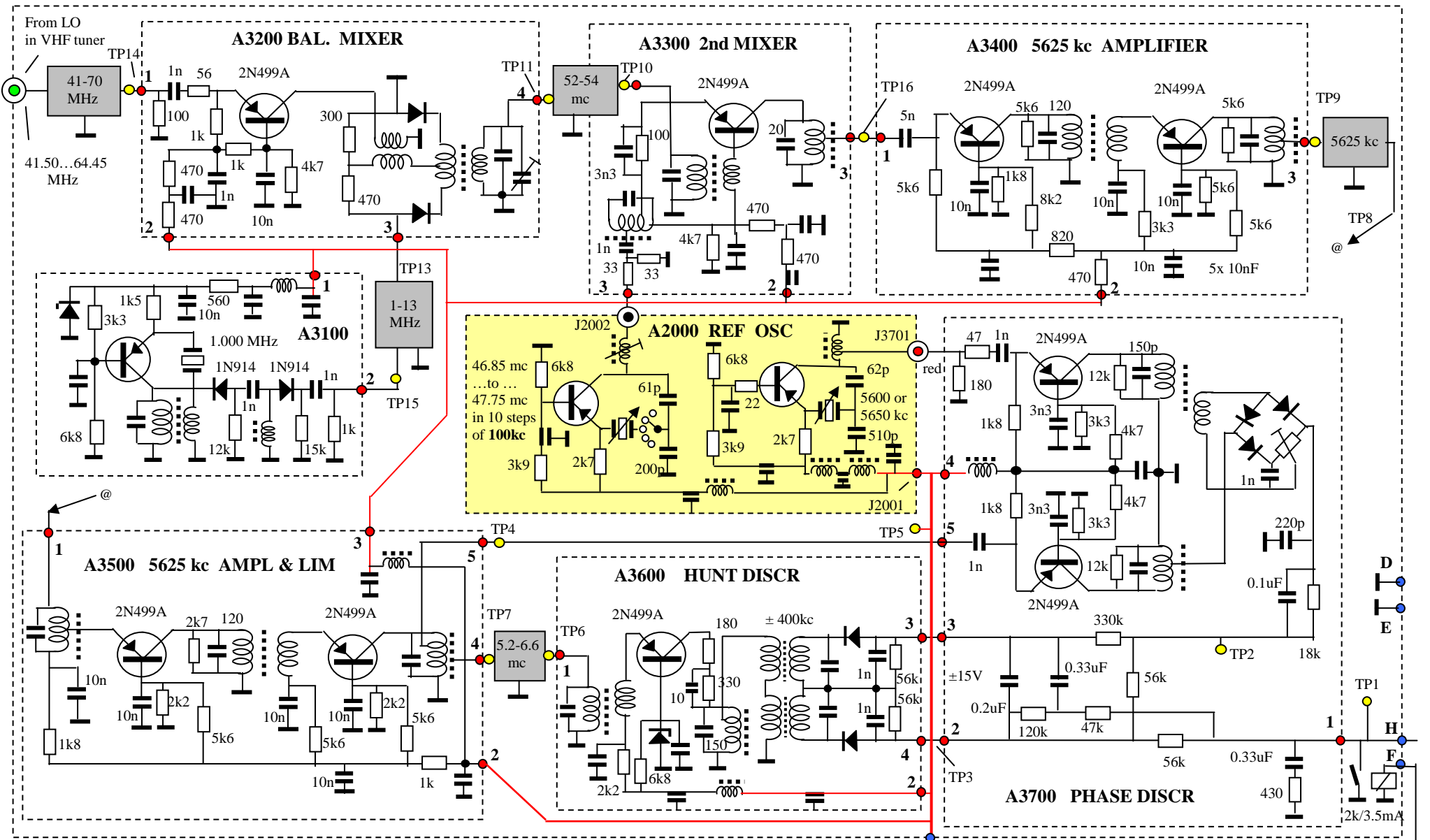
- *Single* heterodyne with 11.5 MHz IF (ARC-54 is a double superhet)
- The local oscillator is **locked** to a harmonic of a 1MHz crystal oscillator plus one of ten crystals spaced 100kHz plus one of two crystals spaced 50kHz. This way, all 920 channels are kept accurate to within 3.5kHz with only 13 crystals.
- Tuning is faster: the ARC-131 has 3 tuning motors, the ARC-54 only has one.
- Tuning of the VHF stages is with **spiral coils**. There are no slug-tuned inductors nor variable capacitors as in the ARC-54. The spiral-coil inductors prevent the use of a uni-directional tuning motor, so an auto-reverse strategy was used to drive the tuning shafts.
- The RF and IF amplifiers in the ARC-131 always have maximum gain. **No AGC** in normal (FM) mode, only controlled gain reduction in HOME mode by PIN diodes in the antenna input circuit and IF amplifier input circuit. The ARC-54 has controlled gain in the RF, variable IF, and fixed IF stages in all modes.
- Non-grounded frequency control lines should be interconnected per digit in the ARC-54, but are left open in the ARC-131.
- Weight of the ARC-131 is 10kg , the ARC-54 is 7.5 kg



RT-823 / ARC-131 Block Diagram
3-3-2013 kb



1 VHF TUNER A1000
20-5-2013 kb

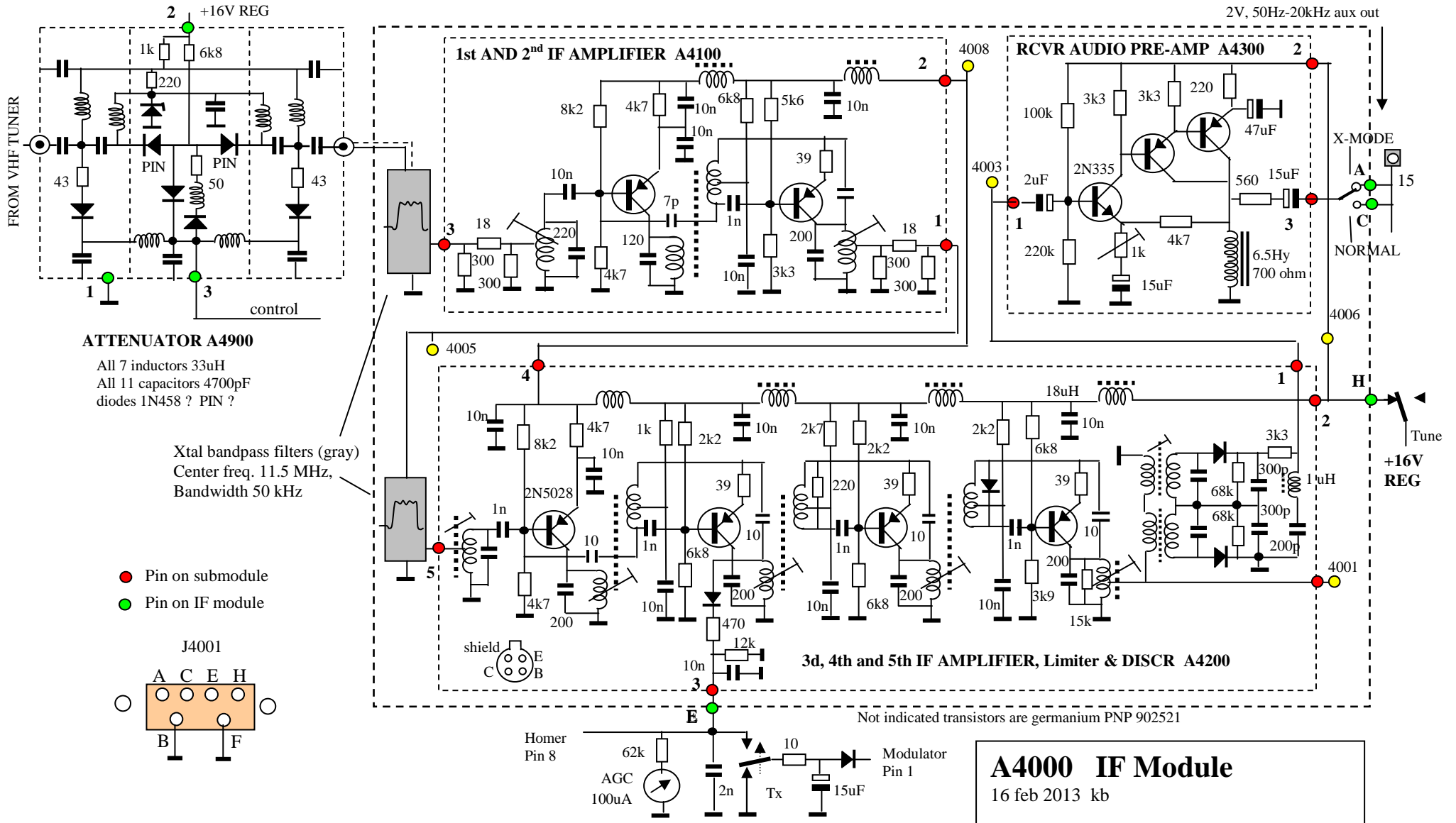


AN/ARC-131

3 CRYSTAL REF SYSTEM

19 May 2013 kb

Startup
Delay
A2100

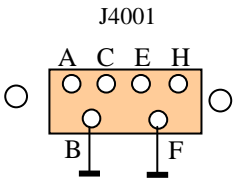


ATTENUATOR A4900

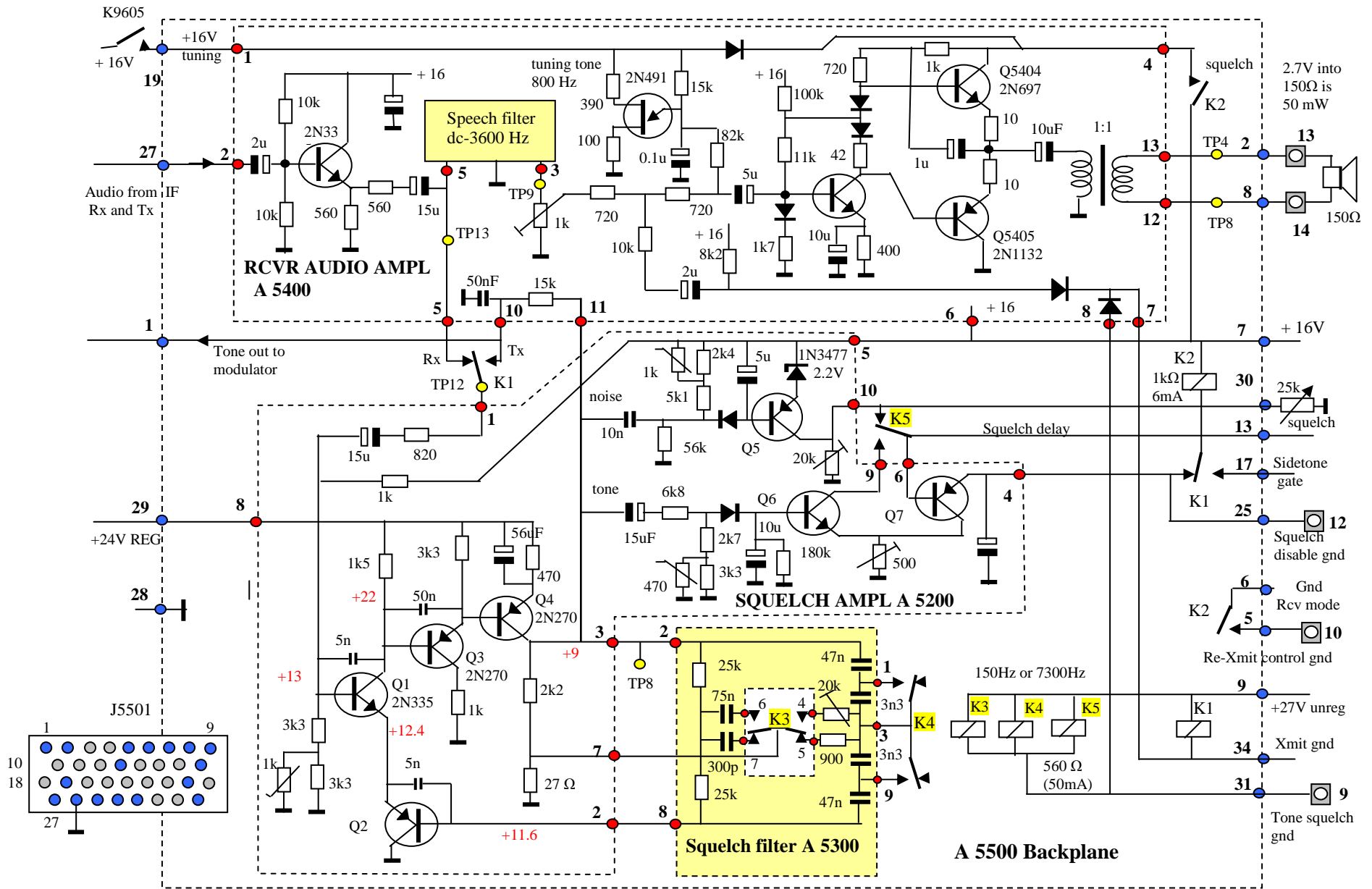
All 7 inductors 33uH
 All 11 capacitors 4700pF
 diodes 1N458 ? PIN ?

Xtal bandpass filters (gray)
 Center freq. 11.5 MHz,
 Bandwidth 50 kHz

- Pin on submodule
- Pin on IF module



A4000 IF Module
 16 feb 2013 kb

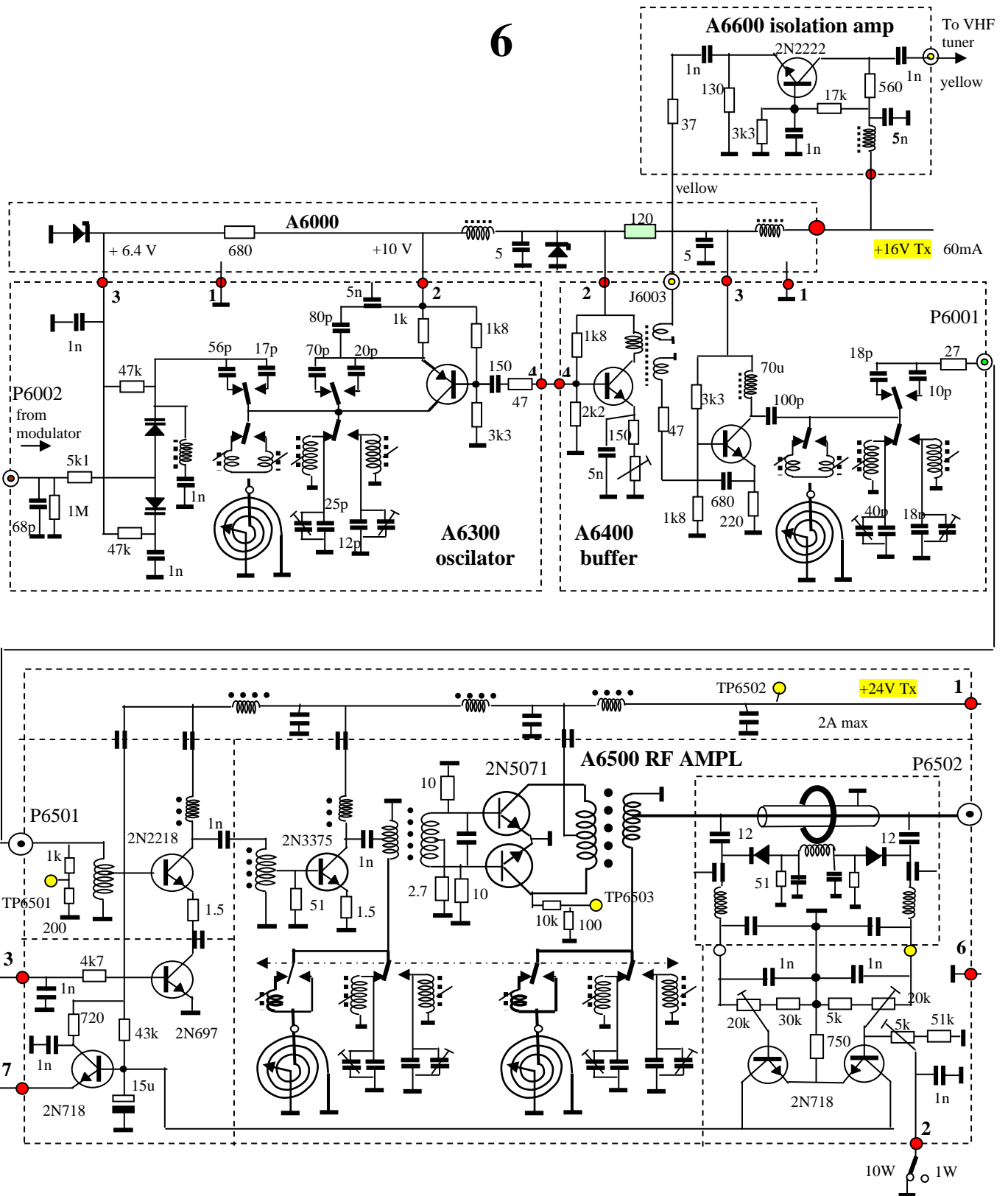


● Backplane in-line test points TP55x abbreviated to TPx

5 RCVR AUDIO
8-8-2013 kb

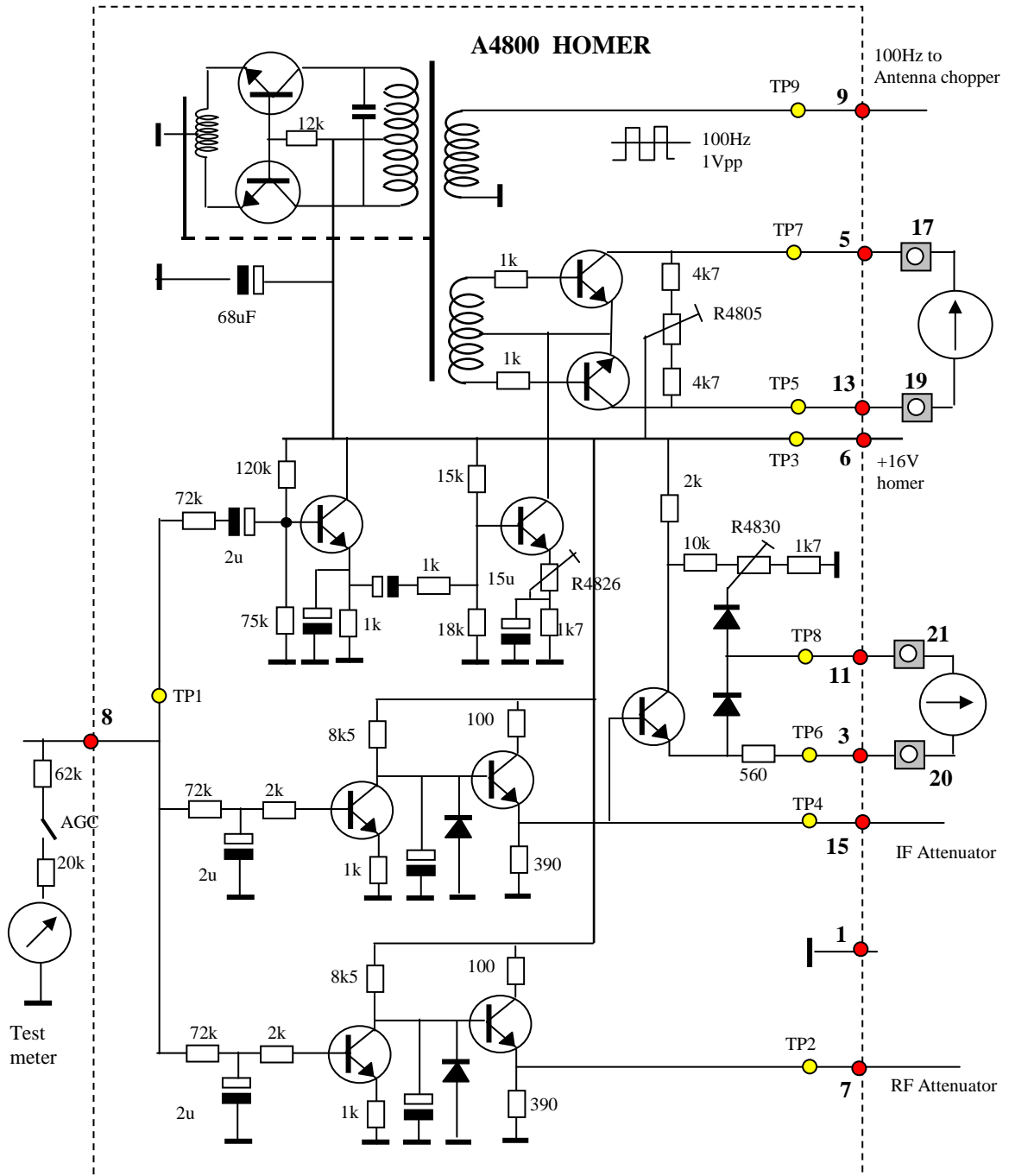


6

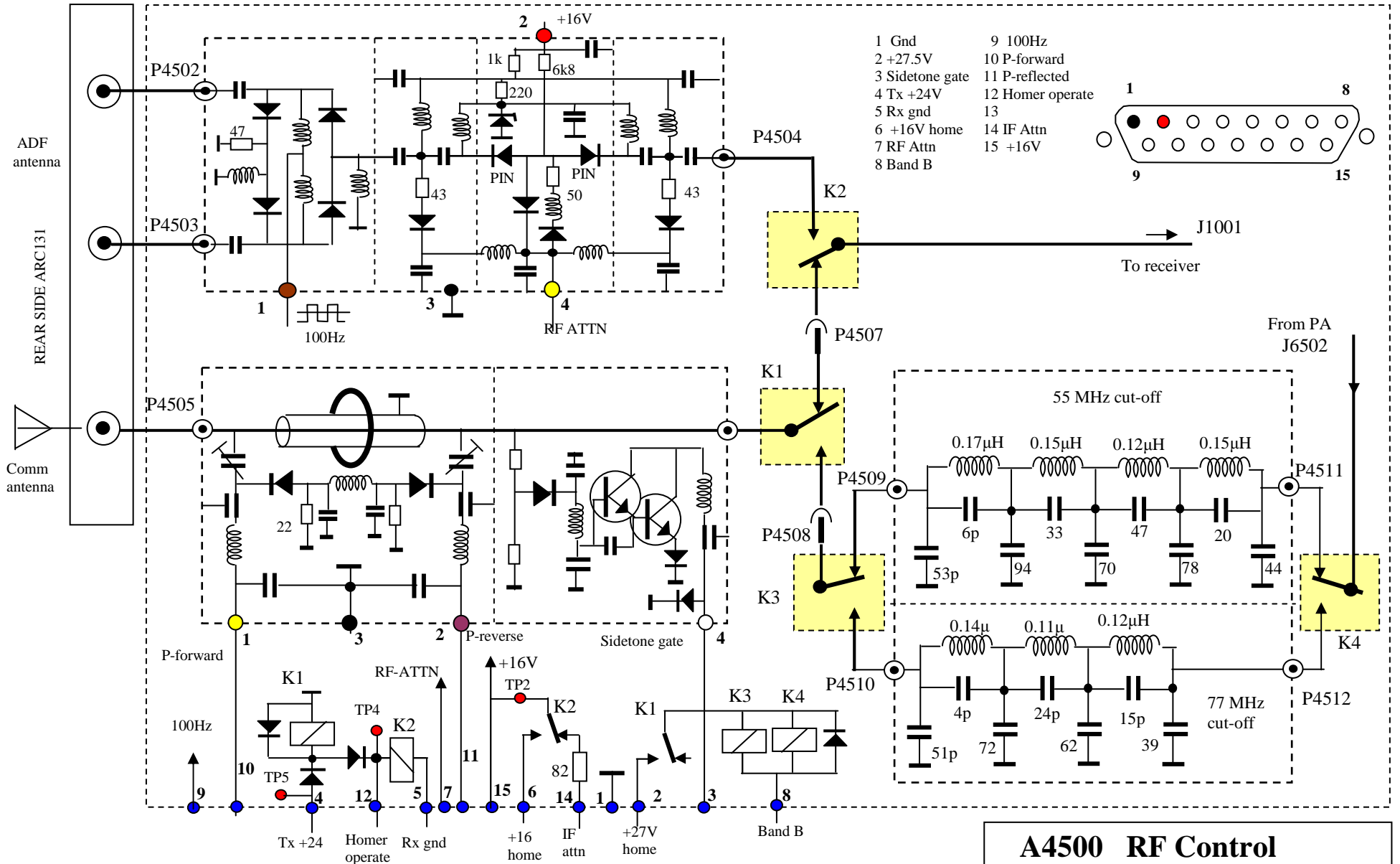


**6 Transmitter RF parts
Oscillator/Buffer/Power Amplifier**

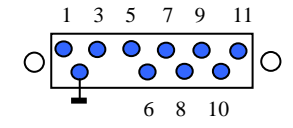
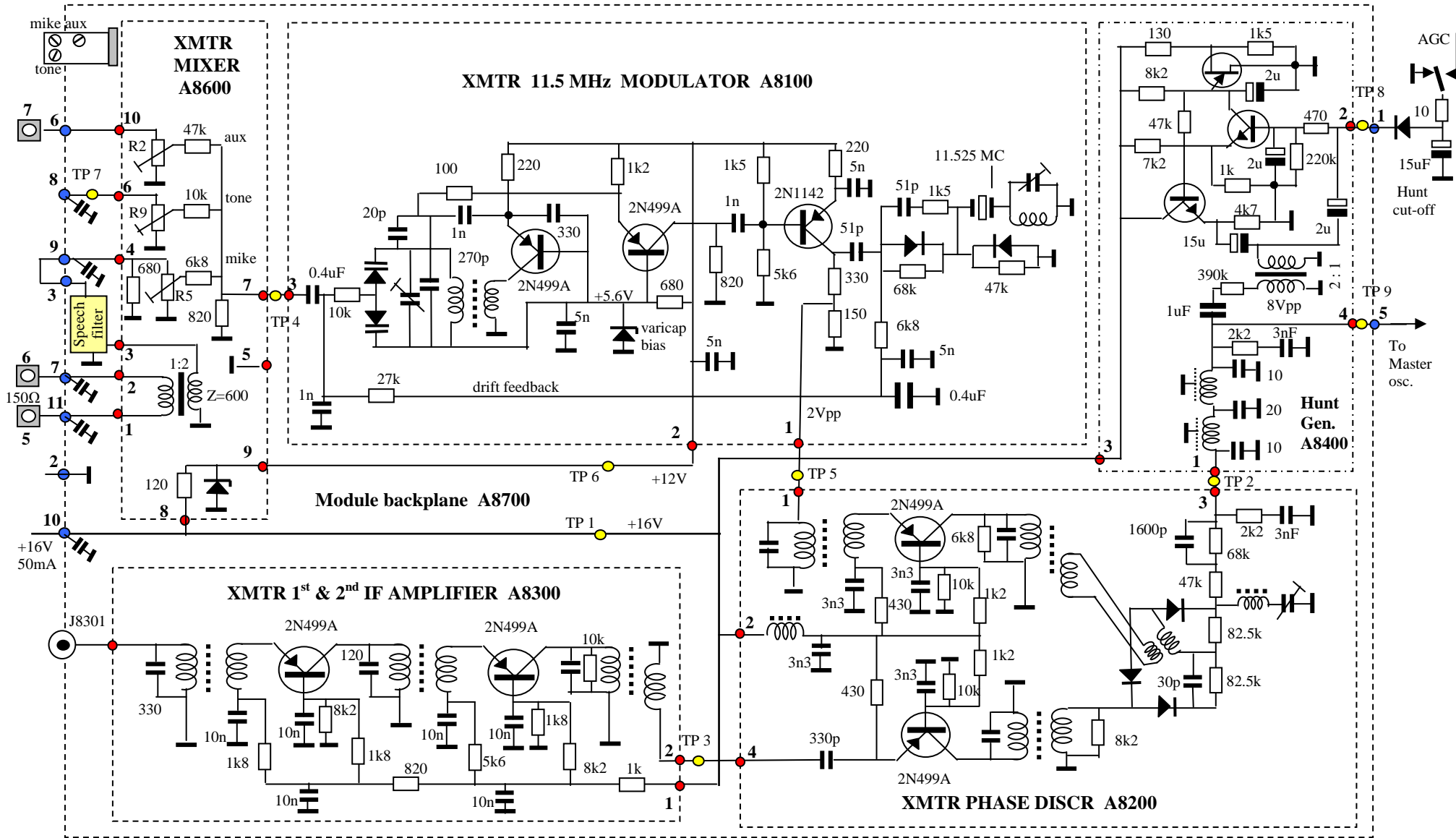
4.8



A4800 HOMER
27-2-2013 kb



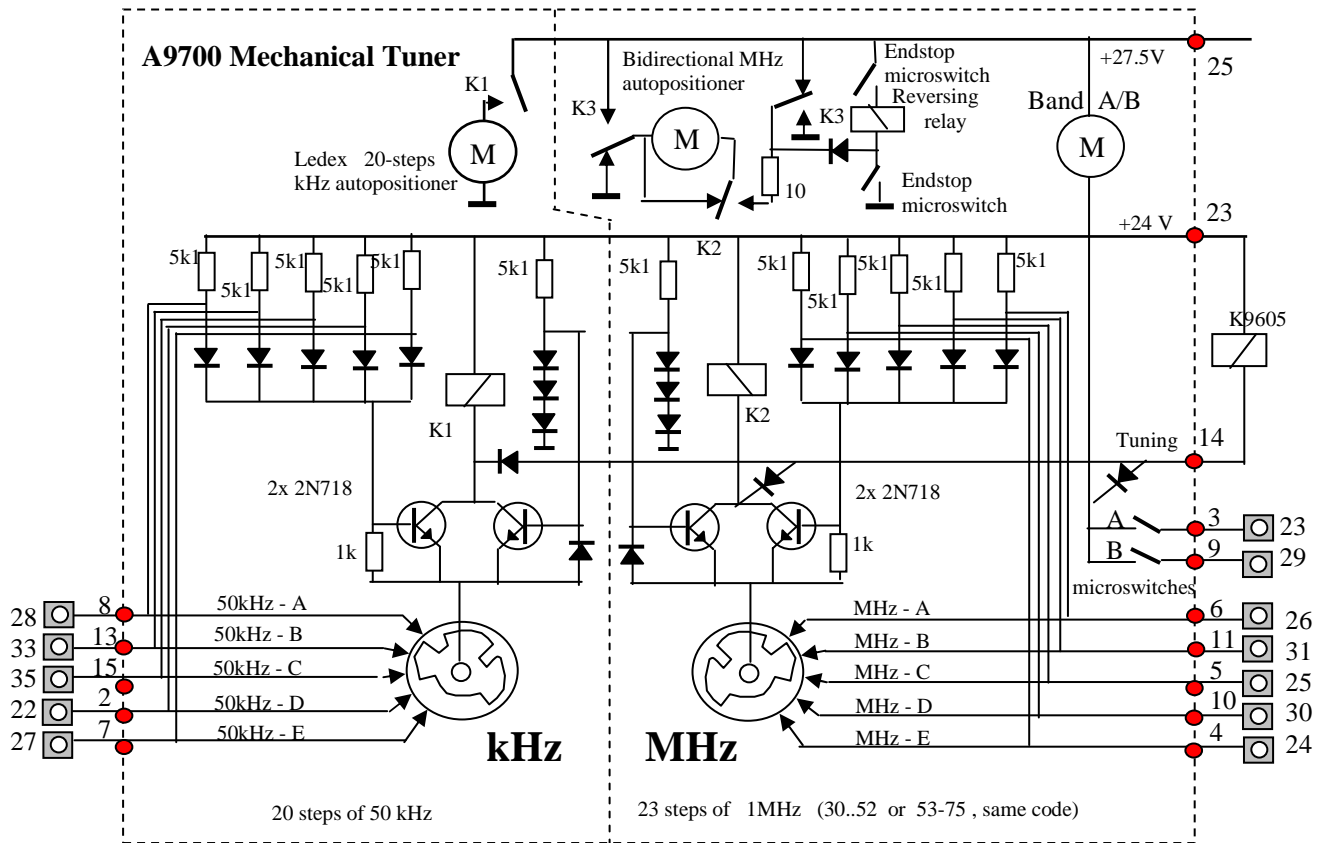
A4500 RF Control
24-2-2013 kb



- Submodule pin
- Module pin
- Pin on RT main connector
- Backplane in-line testpoints TP870x abbreviated to TPx

AN/ARC-131

8 MODULATOR
4-4 2013 kb



Total 20 x 23 x 2 = 920 channels

	.00	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95
A	X					X	X			X	X	X		X	X	X	X			
B		X					X				X	X		X	X	X	X	X		
C			X					X				X		X	X	X	X	X	X	
D				X					X	X			X	X	X	X	X	X	X	X
E	X				X					X	X		X	X	X	X	X	X	X	X

“X” indicates connection to ground in the control panel. Remaining lines are open

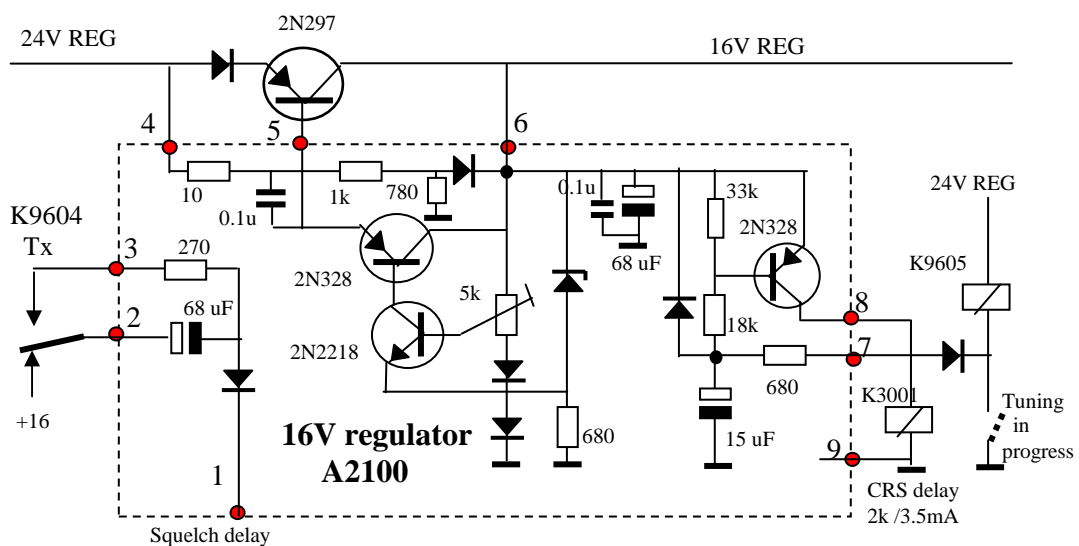
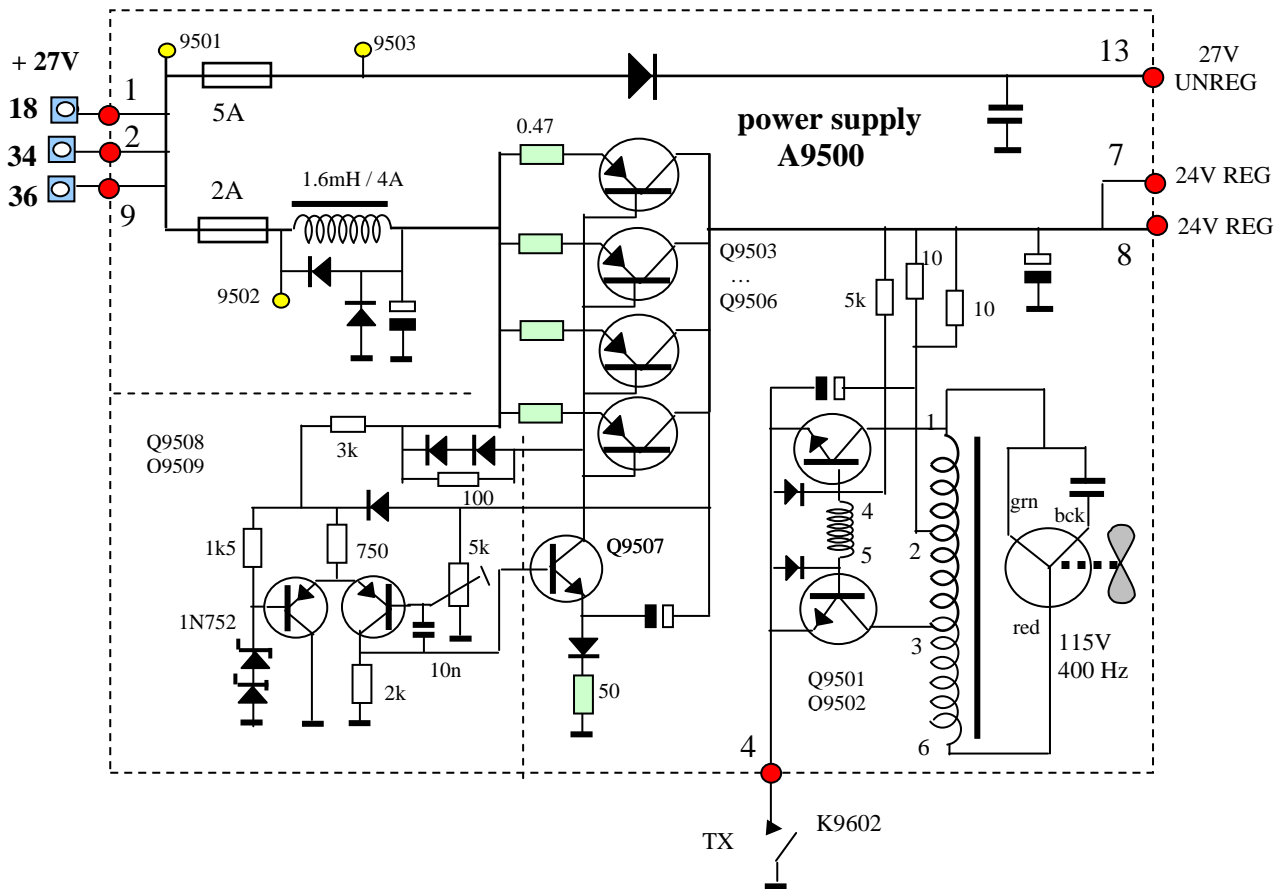
	30 53	31 54	32 55	33 56	34 57	35 58	36 59	37 60	38 61	39 62	40 63	41 64	42 65	43 66	44 67	45 68	46 69	47 70	48 71	49 72	50 73	51 74	52 75
A	X			X	X		X	X	X				X			X	X		X	X	X		
B		X			X	X	X	X	X	X				X			X	X		X	X	X	X
C			X			X	X	X	X	X	X				X		X	X	X	X	X	X	X
D	X			X			X	X	X	X	X	X				X			X	X		X	X
E	X	X	X	X	X	X	X	X	X	X	X	X											X

Pin 29 (J on control panel) is grounded from 53 – 75 MHz (Band B)

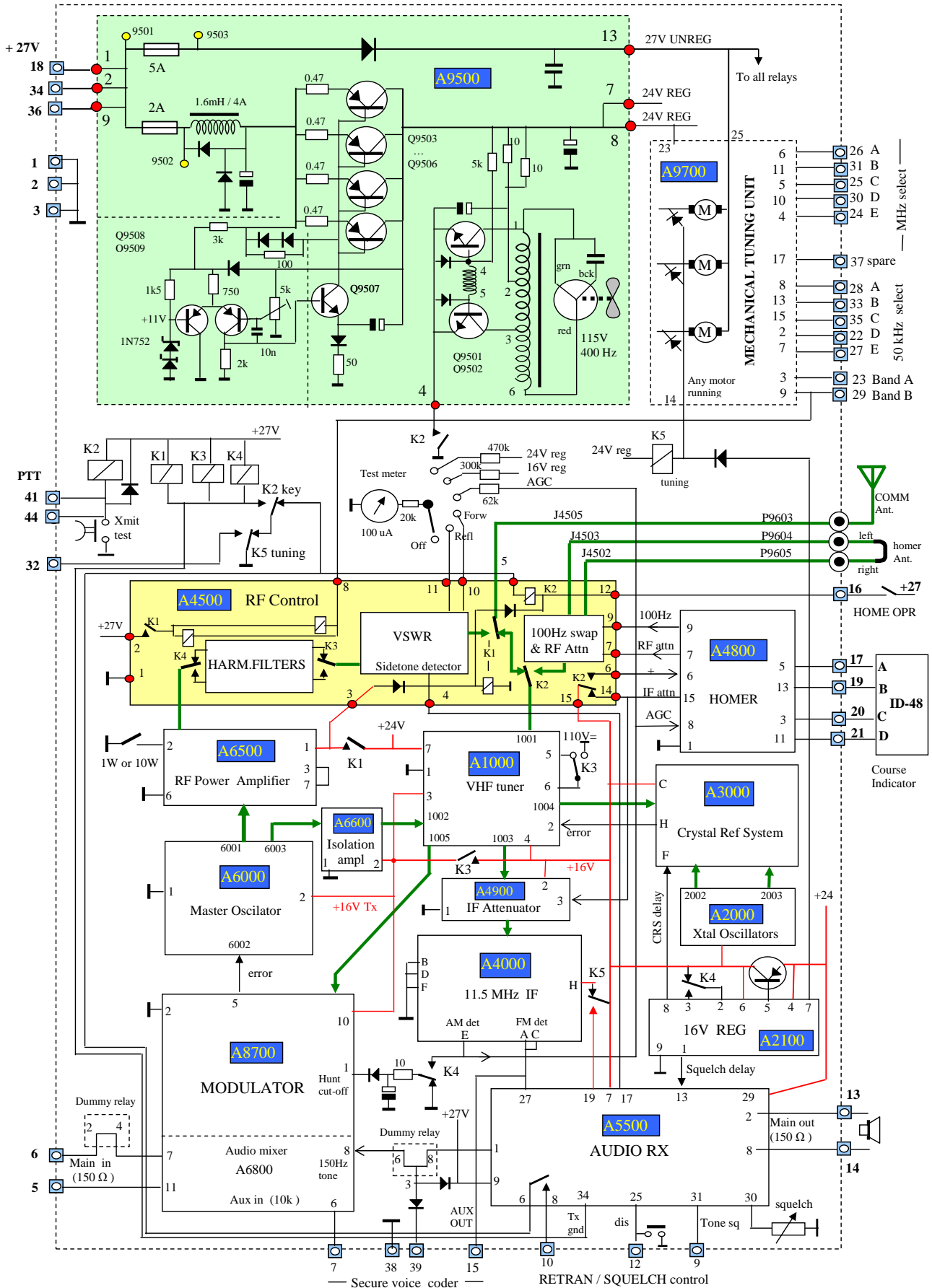
Pin 23 (G on control panel) is grounded from 30 - 52 MHz (Band A)

Pin 32 (h on control panel = tuning) is not used inside the control panel

9.7 Mechanical Tuning Unit



9.5 Power Supplies

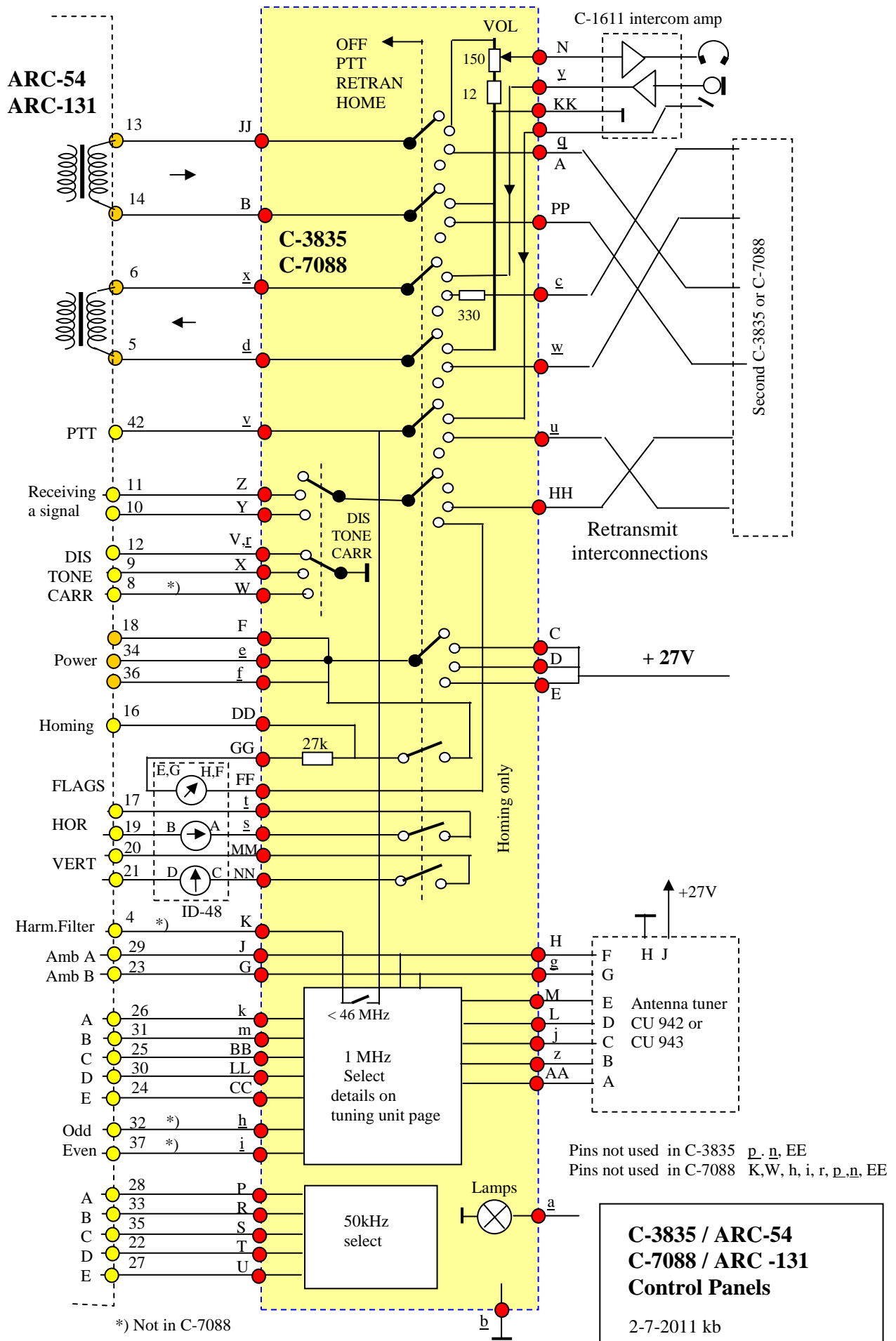


pin of 50-pole Main Connector

Relays shown without module prefix, i.e. on the chassis relay K9601 shown as K1 etc.

RT-823 / ARC-131 MAIN CHASSIS AND POWER SUPPLY
3-5-2013 kb

**ARC-54
ARC-131**



*) Not in C-7088

**C-3835 / ARC-54
C-7088 / ARC -131
Control Panels**

2-7-2011 kb

Pins not used in C-3835 p, n, EE
Pins not used in C-7088 K, W, h, i, r, p, n, EE