

Consisting of:

Power Supply and Ref. Osc.	2006.1
AF Amplifier	2006.2
IF Amplifier	2006.3
Oscillator and RF Stage	2006.4
Position of Components	2006.5
Parts List	2006.6
Circuit Diagram	2006.7

Removal of the Metal Case

After removing the four threaded retainers at the back of the instrument, it is possible to slide the chassis and the front panel out of the case.

Trouble Shooting

If the reason for a fault is not an obvious one such as a faulty transistor, broken down resistor, blown or disconnected fuse etc., then first test the voltages of all the transistors and compare them with the voltages shown in the circuit diagram in order to localize the defect. Should this method of finding the fault prove unsuccessful, then check the instrument by adopting the method described in the adjustment procedure. When the trouble has been found and remedied, the voltages and adjustments which are influenced by the remedy must be rechecked.

The tolerances stated in the instructions can only be used as a guide for adjustment and control, but any deviations must not be corrected without being sure that the tolerances of the instruments used for making the adjustment are so small as to have no influence on the measurements.

The instructions in this Manual are given purely as a guide to the service of equipment with minor faults. Some faults, as f.i. small deviations in tolerances require for their correction special control equipment and extensive experience, and in these cases it is necessary to send the instrument to the factory.

Spare Parts

Please state type- and serialnumber of apparatus when spare parts are ordered.

Instruments necessary for service and repair.

Multimeter (20 k Ω /V $\approx$)

Beat Frequency Oscillator Type 1022

Heterodyne Voltmeter Type 2006

Signal Generator 0.1 - 230 MHz with AM, FM Modulation

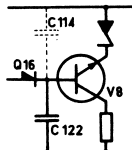
Oscilloscope. Sensitivity for Y-amplifier better than 1 mm/mV.

Frequency Response:

In order to make the frequency characteristic flat down to 100 kHz the ceramic capacitor C 82 of 47 nF has been changed to 0.47 μ F with Stock Reference no. CK 5470.

For the same purpose R 47 is changed to 3.5 k Ω , 5%, 1/3 W. After replacement of the two components check item 4.3.

Reference Oscillator:



Capacitor C 114 was always mounted from base to ground, and if its d.c. resistance was smaller than 500 k Ω the current through V 8 would be dependent on the leakage current in C 114 instead of the regulating input through Q 16. As this input should cause a stable oscillator signal of 5 V across ZS 0085 a bad capacitor could spoil the regulating range of the oscillator amplitude.

The new capacitor is now called C122 and carries the value of 390 pF/250 V with Stock Ref. no. CK 2390.

20 kHz on LF Output:

C 137 has been changed from 2 μ F Polyester to 64 μ F/64 V electrolytic with Stock Reference no. CE 0513 in order to exclude 20 kHz noise on the LF-output. The noise was coupled from the D.C. converter to the low-frequency amplifier via C 137 (polyester type) and the LF volumen control and was visible on an oscilloscope connected across the loudspeaker.

Unwanted Signal Sensitivity

Instruments with serial numbers from 249435 to 293943 are rather sensitive to external signals.

In order to prevent this a modification should be made as follows:

Disconnect the screened wire and the capacitor from the input socket and clean the soldering tags.

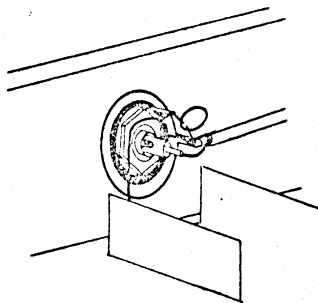
Shorten the leads of the capacitor as much as possible and put it back to the same terminals as it was and resolder the upper end.

Put the screen of the input cable through the two soldering tags like shown on the drawing below and resolder.

Resolder the inner core to the center tap of the socket.

Open the ZC 0008 Probe housing like shown in the Service Instruction under item 2006.4 sheet 2 and mount a capacitor (CK 4470) between the two screens of the Probe cable.

This modification will be factory made in instruments with serial numbers higher than 293943 and this extra capacitor will have Circuit Diagram Ref. no. C 211.



Ceramic Capacitor 47 nF/30 V Stock Ref. no. CK 4470.

1.1. D.C. Voltages

a. POWER SWITCH: "Line"

V1 emitter : -6.2 - -7.0 V
Across C4 : -6.2 - -7.0 V
" C48 : 100 - 115 V
" C15 : -16 V. If necessary adjust P4.
Probe Power -6 V : -6.2 - -7.0 V
" " +50 V : 49 - 57 V

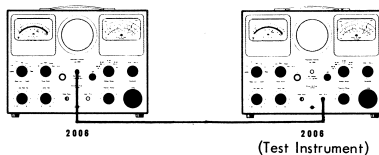
b. POWER SWITCH to "Batt".

Check that the D.C. voltage across C15 is constant -16 V for battery voltages between 5.5 and 7.3 V.

c. POWER SWITCH to "Batt.check"

The meter should deflect to the lower green mark for a battery voltage of 5.5 V.

If not, adjust P6.



1.2. Reference Oscillator

POWER SWITCH: "Line"
VOLTAGE RANGE: "Ref."

Check the reference signal: 2.5 mV, 30 MHz.

The frequency can be adjusted by means of the iron core in ZS 0085.

The voltage can be adjusted by means of C163.

D.C. voltage across C25: -0.5 - -10 V.

1.1. D.C. Voltages

a. POWER SWITCH: "Line"

V1 emitter : -6.2 - -7.0 V
Across C4 : -6.2 - -7.0 V
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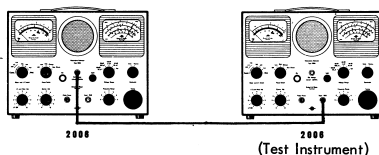
b. POWER SWITCH to "Batt".

Check that the D.C. voltage across C15 is constant -16 V for battery voltages between 5.5 and 7.3 V.

c. POWER SWITCH to "Batt.check"

The meter should deflect to the lower green mark for a battery voltage of 5.5 V.

If not, adjust P 7.



1.2. Reference Oscillator

POWER SWITCH: "Line"
VOLTAGE RANGE: "Ref."

Check the reference signal: 2.5 mV, 30 MHz.

The frequency can be adjusted by means of the iron core in ZS 0085.

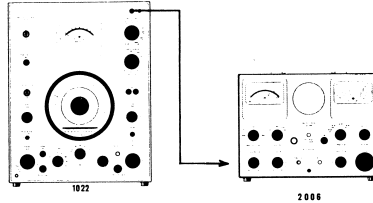
The voltage can be adjusted by means of C163.

D.C. voltage across C25: -0.5 - -10 V.

2.1. D.C. Voltages

POWER SWITCH: "Line"
LS and MOD.ADJ.: "1"

V22, emitter : - 4.5 - -5.5 V
V3, collector : -20 - -25 V
Between midpoint R3, R4 and ground: -10 - -12.5 V



2.2. Sensitivity

METER and LS SWITCH: "Mod. AM"
POWER SWITCH: "Line"
LS and MOD.ADJ.: "10"

Connect the Oscillator type 1022 to potentiometer P8a.
Increase the input voltage at 1000 Hz until full scale deflection on type 2006.
Check the input voltage: 8 - 10 mV.

2.3. Frequency Response

METER and LS SWITCH: "Mod. AM"
POWER SWITCH: "Line"
LS and MOD.ADJ.: "10"

Connect the Oscillator type 1022 to potentiometer P8a and adjust the input voltage at 1000 Hz for a 10 dB deflection on type 2006.
Change the frequency from 30 - 20000 Hz.
Deflection on type 2006: 10 dB
Tolerance: ± 0.5 dB

Great care must be taken when repairing the IF amplifier. Always switch the instrument off before the screening cans on the IF filters are removed. It is normally not necessary to readjust the IF amplifier after replacement of components situated under the first screening can. If a filter is found to be defective, repair it and adjust this filter only.

Max. input voltage without cathode follower: 25 mV.

3.1. D.C. Voltages

POWER SWITCH:"Line"

across R35 : -2 - -2.4 V

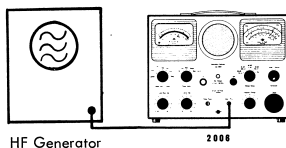
V13, emitter : -2 - -2.4 V

across R37 : -2 - -2.4 V

" R29 : -1.8 - -2.4 V

" R30 : -1.8 - -2.4 V

between midpoint R17, 39 and ground: -2 - -2.4 V.



3.2. Sensitivity

BANDWIDTH:"Wide"

METER and LS SWITCH:"Carrier .AM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line"

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

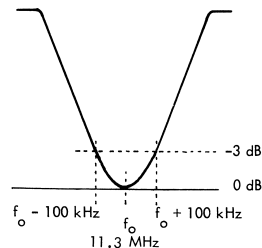
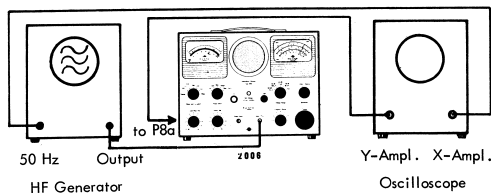
Input signal: 11.3 MHz unmodulated.

Adjust the input voltage for full scale deflection on type 2006.

Input voltage: approx. 1 mV.

If the sensitivity is too low, connect the signal generator to C87 and check the sensitivity of the IF amplifier without "Mixer".

If the input voltage: 50 μ V gives full scale deflection on type 2006 the mixer must be defective, check item 4.5.



3.3. IF Curve

BANDWIDTH:"Wide"

METER and LS SWITCH:"Carrier .AM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line"

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

a. Check of IF curve.

Input signal: 11.3 MHz Modulation swing $\pm 500 \text{ kHz}$
Modulation frequency 50 Hz (60 Hz)

Increase the input voltage until an IF curve can be seen on the oscilloscope.

Do not adjust any filter without being sure that the filter in question is out of tune.

b. Check of bandwidth.

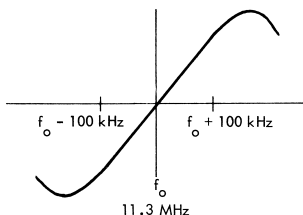
Input signal: 11.3 MHz unmodulated.

Adjust the input voltage for a 10 dB deflection on type 2006.

Change the frequency around the center frequency and note the frequency where the deflection is decreased by 3 dB.

Bandwidth: 200 kHz $\pm$ 10 kHz.

If necessary adjust C160 and C161.



3.4. FM Discriminator

BANDWIDTH:"Wide"

METER and LS SWITCH:"Carrier.FM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line."

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

Input signal: 11.3 MHz, Modulation swing: $\pm$ 500 kHz.

Modulation frequency: 50 Hz (60 Hz)

Increase the input voltage until the discriminator S-curve can be seen on the oscilloscope.

If the curve is unsymmetrical, adjust the iron cores in ZS 0079.

3.5. Distortion

BANDWIDTH:"Wide"

METER and LS SWITCH:"Mod.AM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line"

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

Input signal: 11.3 MHz, Modulation degree: 80% .

Modulation frequency 50-1000 Hz.

Adjust the input voltage for full scale deflection on type 2006.

The AF frequency curve seen on the oscilloscope must not be distorted.

3.6. Bandwidth Selector

a. BANDWIDTH:"Narrow"

METER and LS SWITCH:"Carrier.AM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line"

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

Input signal: 11.3 MHz unmodulated.

Fine adjust the frequency to max. deflection and adjust the voltage for a 10 dB deflection on type 2006.

b. BANDWIDTH to "Wide"

Deflection on type 2006: 10 dB

Tolerance: $\pm$ 0.25 dB

Great care must be taken when repairing the IF amplifier. Always switch the instrument off before the screening cans on the IF filters are removed. It is normally not necessary to readjust the IF amplifier after replacement of components situated under the first screening can. If a filter is found to be defective, repair it and adjust this filter only.

Max. input voltage without cathode follower: 25 mV.

3.1. D.C. Voltages

POWER SWITCH:"Line"

across R35 : -2 - -2.4 V

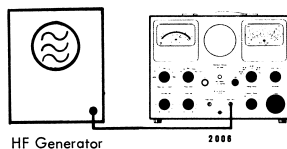
V13, emitter : -2 - -2.4 V

across R37 : -2 - -2.4 V

" R29 : -1.8 - -2.4 V

" R30 : -1.8 - -2.4 V

between midpoint R17, 39 and ground: -2 - -2.4 V.



3.2. Sensitivity

BANDWIDTH:"Wide"

METER and LS SWITCH:"Carrier. AM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line"

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

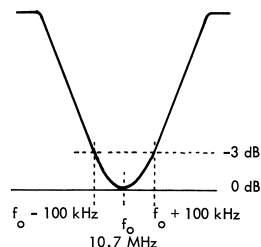
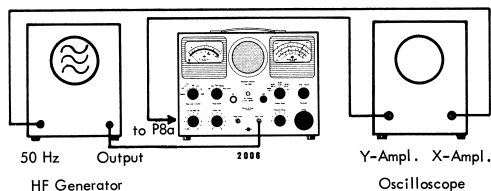
Input signal: 10.7 MHz unmodulated.

Adjust the input voltage for full scale deflection on type 2006.

Input voltage: approx. 1 mV.

If the sensitivity is too low, connect the signal generator to C87 and check the sensitivity of the IF amplifier without "Mixer".

If the input voltage: 50 μ V gives full scale deflection on type 2006 the mixer must be defective, check item 4.5.



3.3. IF Curve

BANDWIDTH:"Wide"

METER and LS SWITCH:"Carrier. AM"

VOLTAGE RANGE:"5 mV"

POWER SWITCH:"Line"

CARRIER ADJ.:"10"

FREQUENCY RANGE:"4"

TUNING:"Fully counter clockwise"

a. Check of IF curve.

Input signal: 10.7 MHz Modulation swing $\pm$ 500 kHz

Modulation frequency 50 Hz (60 Hz)

Increase the input voltage until an IF curve can be seen on the oscilloscope.

Do not adjust any filter without being sure that the filter in question is out of tune.

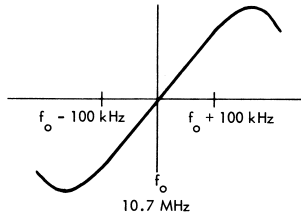
- b. Check of bandwidth.
Input signal: 10.7 MHz unmodulated.

Adjust the input voltage for a 10 dB deflection on type 2006.

Change the frequency around the center frequency and note the frequency where the deflection is decreased by 3 dB.

Bandwidth: 200 kHz $\pm$ 10 kHz.

If necessary adjust C160 and C161.



3.4. FM Discriminator

BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier.FM"
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line."
CARRIER ADJ.:"10"
FREQUENCY RANGE:"4"
TUNING:"Fully counter clockwise"

Input signal: 10.7 MHz, Modulation swing: $\pm$ 500 kHz.

Modulation frequency: 50 Hz (60 Hz)

Increase the input voltage until the discriminator S-curve can be seen on the oscilloscope.

If the curve is unsymmetrical, adjust the iron cores in ZS 0079.

3.5. Distortion

BANDWIDTH:"Wide"
METER and LS SWITCH:"Mod.AM"
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line"
CARRIER ADJ.:"10"
FREQUENCY RANGE:"4"
TUNING:"Fully counter clockwise"

Input signal: 10.7 MHz, Modulation degree: 80%.

Modulation frequency 50-1000 Hz.

Adjust the input voltage for full scale deflection on type 2006.

The AF frequency curve seen on the oscilloscope must not be distorted.

3.6. Bandwidth Selector

- a. BANDWIDTH:"Narrow"
METER and LS SWITCH:"Carrier.AM"
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line"
CARRIER ADJ.:"10"
FREQUENCY RANGE:"4"
TUNING:"Fully counter clockwise"

Input signal: 10.7 MHz unmodulated.

Fine adjust the frequency to max. deflection and adjust the voltage for a 10 dB deflection on type 2006.

- b. BANDWIDTH to "Wide"

Deflection on type 2006: 10 dB

Tolerance: $\pm$ 0.25 dB

3.7. Modulation

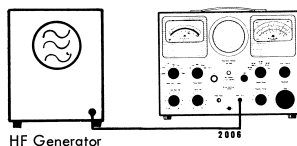
- a. BANDWIDTH:"Wide"
METER and LS SWITCH:"Mod.Adj."
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"Fully counter clockwise"
- b. METER and LS SWITCH to "Mod.AM"
- c. METER and LS SWITCH to "Mod.Adj."
- d. METER and LS SWITCH to "Mod.FM"

Input signal: 11.3 MHz, Modulation degree: 30%.
Modulation frequency: 400 Hz.
Adjust:"LS and Mod.Adj." to full scale deflection on type 2006.

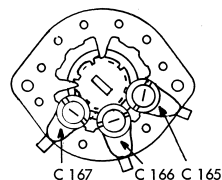
Deflection on type 2006: 30%
Tolerance: $\pm 2\%$ of full scale deflection (0-80%)
If necessary adjust P2.
Input signal: 11.3 MHz, Modulation swing: ± 30 kHz.
Modulation frequency: 400 Hz.

Adjust "LS and Mod.Adj." to full scale deflection on type 2006.

Deflection on type 2006: 30 kHz.
Tolerance: $\pm 2\%$ of full scale deflection (0 - 80 kHz)
If necessary adjust P3.



Rear view of switch VOLTAGE RANGE



3.8. Voltage Range

- a. BANDWIDTH:"Narrow"
METER and LS SWITCH:"Carrier.AM"
VOLTAGE RANGE:"50 μ V"
POWER SWITCH:"Line"
CARRIER ADJ.:"10"
FREQUENCY RANGE:"1"
TUNING:"2 MHz"
- b. VOLTAGE RANGE to "500 μ V"
- c. VOLTAGE RANGE to "5 mV"
- d. VOLTAGE RANGE to "50 mV"

Input signal: 2 MHz unmodulated.
Adjust the input voltage for a 10 dB deflection on type 2006.

Increase the input voltage 20 dB.
Deflection on type 2006: 10 dB
Tolerance: ± 0.2 dB
If necessary adjust C 167.

Increase the input voltage 20 dB.
Deflection on type 2006: 10 dB
Tolerance: ± 0.2 dB
If necessary adjust C 166.

Increase the input voltage 20 dB.
Deflection on type 2006: 10 dB
Tolerance: ± 0.2 dB
If necessary adjust C 165.

3.7. Modulation

- BANDWIDTH:"Wide"
METER and LS SWITCH:"Mod.Adj."
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"Fully counter clockwise"
- METER and LS SWITCH to "Mod.AM"
- METER and LS SWITCH to "Mod.Adj."
- METER and LS SWITCH to "Mod.FM"

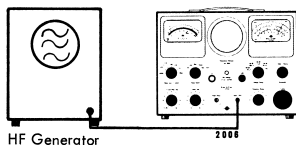
Input signal: 10.7 MHz, Modulation degree: 30%.
Modulation frequency: 400 Hz.
Adjust:"LS and Mod.Adj." to full scale deflection on type 2006.

Deflection on type 2006: 30%
Tolerance: $\pm 2\%$ of full scale deflection (0-80%)
If necessary adjust P2.

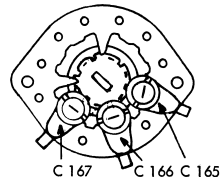
Input signal: 10.7 MHz, Modulation swing: ± 30 kHz.
Modulation frequency: 400 Hz.

Adjust "LS and Mod.Adj." to full scale deflection on type 2006.

Deflection on type 2006: 30 kHz.
Tolerance: $\pm 2\%$ of full scale deflection (0 - 80 kHz)
If necessary adjust P3.



Rear view of switch VOLTAGE RANGE



3.8. Voltage Range

- BANDWIDTH:"Narrow"
METER and LS SWITCH:"Carrier.AM"
VOLTAGE RANGE:"50 μ V"
POWER SWITCH:"Line"
CARRIER ADJ.:"10"
FREQUENCY RANGE:"1"
TUNING:"2 MHz"
- VOLTAGE RANGE to "500 μ V"
- VOLTAGE RANGE to "5 mV"
- VOLTAGE RANGE to "50 mV"

Input signal: 2 MHz unmodulated.

Adjust the input voltage for a 10 dB deflection on type 2006.

Increase the input voltage 20 dB.
Deflection on type 2006: 10 dB
Tolerance: ± 0.2 dB
If necessary adjust C 167.

Increase the input voltage 20 dB.
Deflection on type 2006: 10 dB
Tolerance: ± 0.2 dB
If necessary adjust C 166.

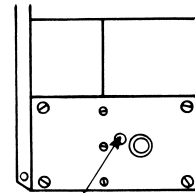
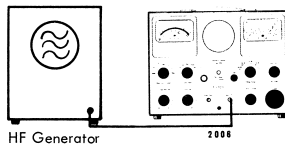
Increase the input voltage 20 dB.
Deflection on type 2006: 10 dB
Tolerance: ± 0.2 dB
If necessary adjust C 165.

Except for components in tuned circuit, transistor V21 and diode Q25, all components can be replaced without readjustment. If a filter is found to be defective repair it and adjust this filter only. Whenever transistor V21 and diode Q25 is replaced it is necessary to readjust all the filters ZS 0065 - 0071.

Max. input voltage without cathode follower: 25 mV.

4.1. D.C. Voltages

V10, emitter: -2 - -2.5 V.
across C79: -16 V.
across C109: min. -2 V



Hole for adjustment of filters ZS 0065-0071

4.2. Adjustment of Frequency Scale

BANDWIDTH: "Wide"
METER and LS SWITCH: "Carrier, AM"
VOLTAGE RANGE: "5 mV"
POWER SWITCH: "Line"
CARRIER ADJ.: "10"

Set FREQUENCY RANGE in the required position and turn TUNING to the lowest frequency mark on the scale (not the scale beginning mark).

Adjust the frequency of the input signal to max. deflection and the voltage to half scale deflection on type 2006. (Switch BANDWIDTH to "Narrow" for FREQUENCY RANGE in position "1").

Tolerance of the frequency scale: 2%

If not adjust the iron core in one of the filters ZS 0065 - 0071 according to the position of FREQUENCY RANGE to max. deflection on type 2006.

If transistor V21 has been replaced, check the frequency scale at the high end.

Tolerance: $\pm 2\%$

If the frequency scale is out of tolerance at the high end for all positions of the FREQUENCY RANGE, adjust C168.

The capacitor is located under the tuning capacitor, and can be adjusted after the bottom plate has been removed.

4.3. Frequency Response

a. BANDWIDTH: "Narrow"
METER and LS SWITCH: "Carrier, AM"
VOLTAGE RANGE: "5 mV"
POWER SWITCH: "Line"
CARRIER ADJ.: "10"
FREQUENCY RANGE: "1"

Check the frequency response with cathode follower.

Tolerance for frequency: 0.1 - 6 MHz: ± 0.5 dB.

b. BANDWIDTH: "Wide"
FREQUENCY RANGE in all other positions

Tolerance for frequency: 6 - 54 MHz: ± 0.5 dB
54 - 120 MHz: ± 1.0 dB
120 - 230 MHz: ± 1.5 dB

The frequency response can be adjusted by moving the coupling coil to or from the oscillator coil. Do not try to correct small deviations in tolerances. If necessary to adjust, bear in mind that just a little movement of the winding has a great influence on the frequency response.

The frequency response for FREQUENCY RANGE in position 6 and 7 can also be adjusted by means of C50.

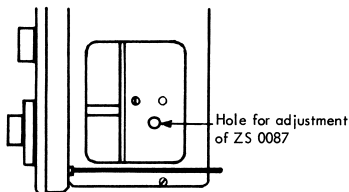
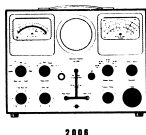
4.4. Cathode Follower

BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier.AM"
VOLTAGE RANGE:"Ref."
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"30 MHz"

Connect INPUT direct to REF. VOLTAGE and adjust "Carrier Adj." to 10 dB deflection on type 2006.

Connect the cathode follower to REF. VOLTAGE.

Deflection on type 2006: 3.5 dB
Tolerance: ± 1 dB



4.5. Check of the Gain

BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier.AM"
VOLTAGE RANGE:"Ref."
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"30 MHz"

Connect the cathode follower to REF.VOLTAGE.

By tuning "Carrier Adj." to "10" min. 10 dB deflection on type 2006 should be obtained. If not, adjust the iron core in ZS 0087 to max. deflection.

If the gain is too low, measure the signal on C87, this should be approx. 12 mV.

4.6. Noise

- a. BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier.AM"
VOLTAGE RANGE:"Ref."
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"30 MHz"

Connect the cathode follower to REF.VOLTAGE and adjust "Carrier Adj." for a deflection on type 2006 to the red mark.

Disconnect the cathode follower and turn VOLTAGE RANGE to "50 μ V".

Deflection on type 2006: approx. 5 μ V

Connect INPUT direct to REF. VOLTAGE and adjust "Carrier Adj." for a deflection on type 2006 to the red mark. VOLTAGE RANGE in position "Ref".

Disconnect INPUT and turn VOLTAGE RANGE to "50 μ V".

Deflection on type 2006: approx. 1 μ V

Check again the noise level (pick-up from oscillator)

Deflection on type 2006: approx. 5 μ V

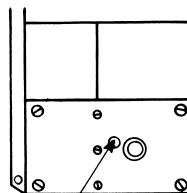
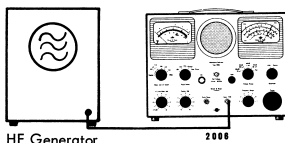
- b. BANDWIDTH to "Narrow"
FREQUENCY RANGE to "1"
TUNING to "0.1 MHz"

Except for components in tuned circuit, transistor V21 and diode Q25, all components can be replaced without readjustment. If a filter is found to be defective repair it and adjust this filter only. Whenever transistor V21 and diode Q25 is replaced it is necessary to readjust all the filters ZS 0065 - 0071.

Max. input voltage without cathode follower: 25 mV.

4.1. D.C. Voltages

V10, emitter: -2 - -2.5 V.
across C79 : -16 V.
across C 109: min. -2 V



Hole for adjustment of filters ZS 0065-0071

4.2. Adjustment of Frequency Scale

BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier, AM"
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line"
CARRIER ADJ.:"10"

Set FREQUENCY RANGE in the required position and turn TUNING to the lowest frequency mark on the scale (not the scale beginning mark).

Adjust the frequency of the input signal to max. deflection and the voltage to half scale deflection on type 2006. (Switch BANDWIDTH to "Narrow" for FREQUENCY RANGE in position "1".

Tolerance of the frequency scale: 2%

If not adjust the iron core in one of the filters ZS 0065 - 0071 according to the position of FREQUENCY RANGE to max. deflection on type 2006.

If transistor V 21 has been replaced, check the frequency scale at the high end.

Tolerance: $\pm 2\%$

If the frequency scale is out of tolerance at the high end for all positions of the FREQUENCY RANGE, adjust C168.

The capacitor is located under the tuning capacitor, and can be adjusted after the bottom plate has been removed.

4.3. Frequency Response

a. BANDWIDTH:"Narrow"
METER and LS SWITCH:"Carrier, AM"
VOLTAGE RANGE:"5 mV"
POWER SWITCH:"Line"
CARRIER ADJ.:"10"
FREQUENCY RANGE:"1"

Check the frequency response with cathode follower.

Tolerance for frequency: 0.1 - 6 MHz: ± 0.5 dB.

b. BANDWIDTH:"Wide"
FREQUENCY RANGE in
all other positions

Tolerance for frequency: 6 - 54 MHz: ± 0.5 dB
54 - 120 MHz: ± 1.0 dB
120 - 230 MHz: ± 1.5 dB

The frequency response can be adjusted by moving the coupling coil to or from the oscillator coil. Do not try to correct small deviations in tolerances. If necessary to adjust, bear in mind that just a little movement of the winding has a great influence on the frequency response.

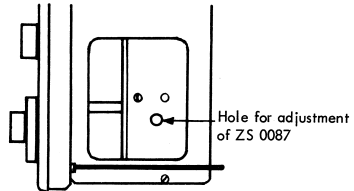
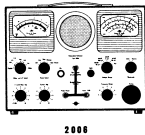
4.4. Cathode Follower

BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier. AM"
VOLTAGE RANGE:"Ref."
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"30 MHz"

Connect INPUT direct to REF. VOLTAGE and adjust "Carrier Adj." to 10 dB deflection on type 2006.

Connect the cathode follower to REF. VOLTAGE.

Deflection on type 2006: 3.5 dB
Tolerance: ± 1 dB



4.5. Check of the Gain

BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier. AM"
VOLTAGE RANGE:"Ref."
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"30 MHz"

Connect the cathode follower to REF. VOLTAGE.

By tuning "Carrier Adj." to "10" min. 10 dB deflection on type 2006 should be obtained. If not, adjust the iron core in ZS 0087 to max. deflection.
If the gain is too low, measure the signal on C87, this should be approx. 12 mV.

4.6. Noise

- a. BANDWIDTH:"Wide"
METER and LS SWITCH:"Carrier. AM"
VOLTAGE RANGE:"Ref."
POWER SWITCH:"Line"
FREQUENCY RANGE:"4"
TUNING:"30 MHz"

Connect the cathode follower to REF. VOLTAGE and adjust "Carrier Adj." for a deflection on type 2006 to the red mark.

Disconnect the cathode follower and turn VOLTAGE RANGE to "50 μ V".

Deflection on type 2006: approx. 5 μ V

Connect INPUT direct to REF. VOLTAGE and adjust "Carrier Adj." for a deflection on type 2006 to the red mark. VOLTAGE RANGE in position "Ref".

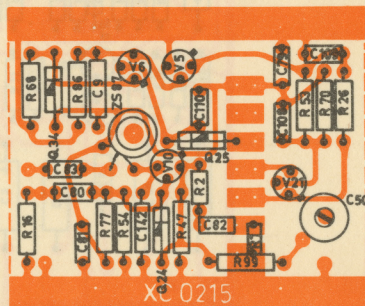
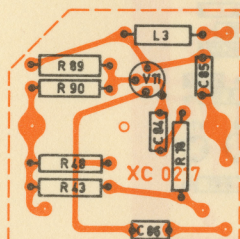
Disconnect INPUT and turn VOLTAGE RANGE to "50 μ V".

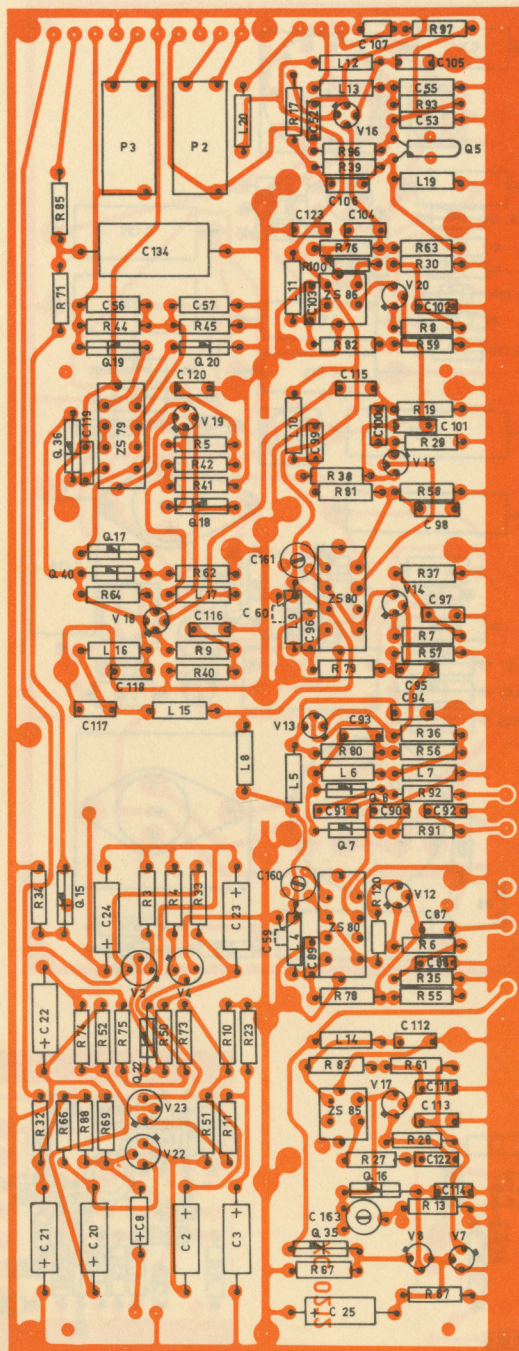
Deflection on type 2006: approx. 1 μ V

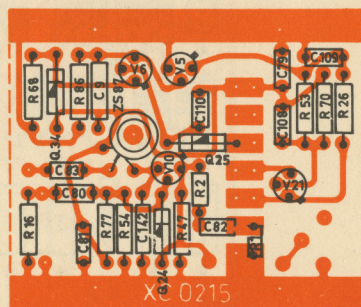
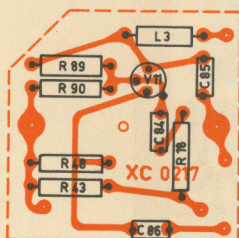
Check again the noise level (pick-up from oscillator)

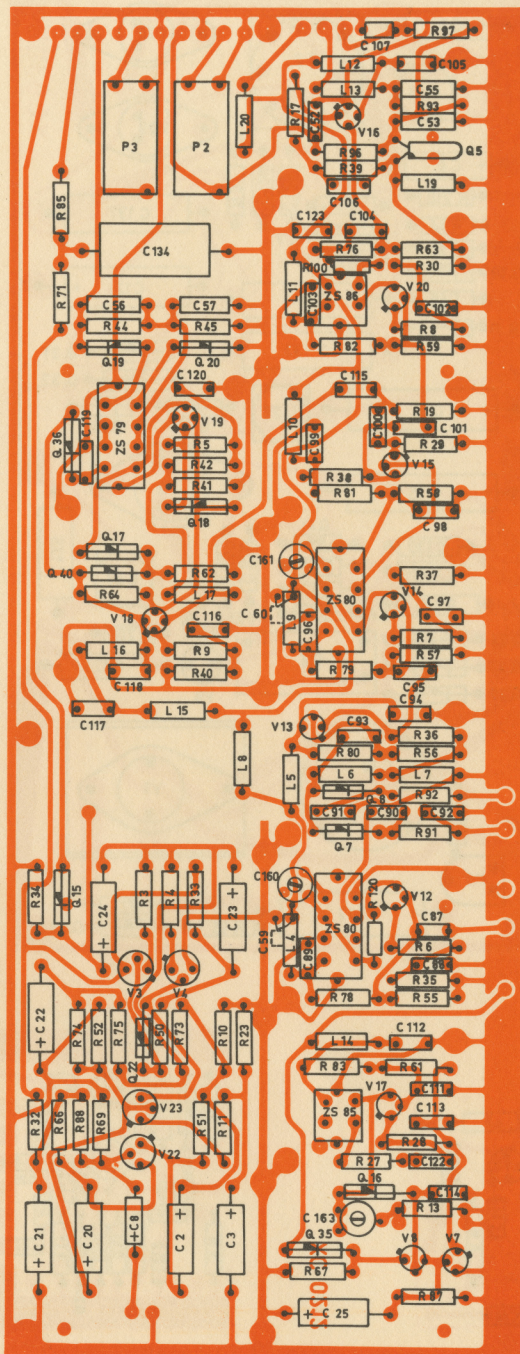
Deflection on type 2006: approx. 5 μ V

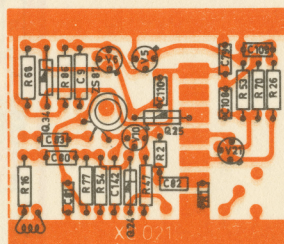
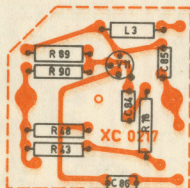
- b. BANDWIDTH to "Narrow"
FREQUENCY RANGE to "1"
TUNING to "0.1 MHz"

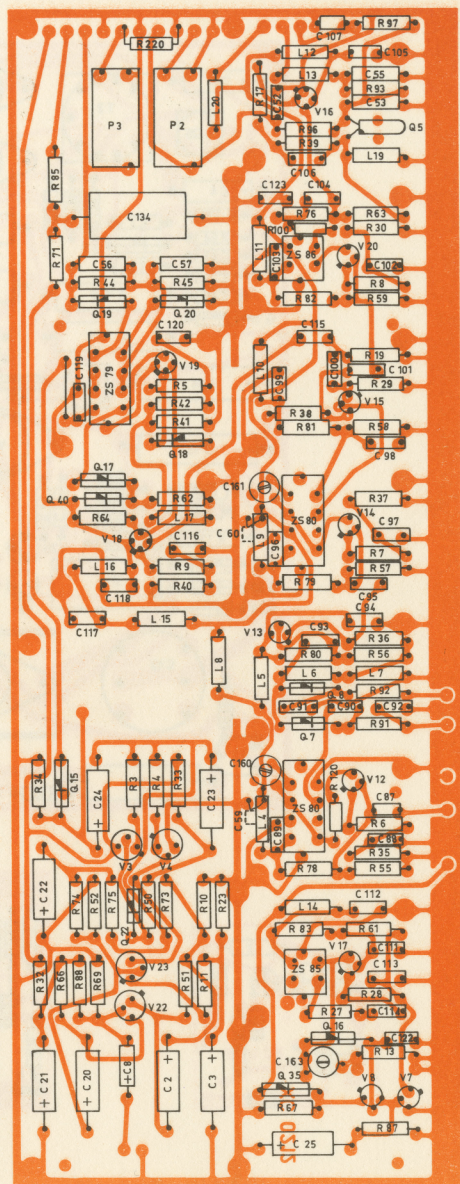












valid from serial no. 142171

COMPONENT TYPE	STOCK REFERENCE	CIRCUIT DIAGRAM REF.	COMPONENT	STOCK REFERENCE	CIRCUIT DIAGRAM REF.
CAPACITORS:					
Electrolytic	2 μ F/ 70 V	CE 0401	C 8,9,10		
"	50 μ F/ 25 V	CE 8965	C 20-25		
"	250 μ F/ 25 V	CE 8919	C 15-17		
"	2 x 1000 μ F/ 25 V	CE 0402	C 12		
"	10 μ F/ 15 V	CE 0001	C 1		
"	100 μ F/ 6 V	CE 0002	C 2-5		
Ceramic	75 pF/500 V	CK 0101	C 32		
"	500 pF/500 V	CK 0083	C 54		
"	1 nF/500 V	CK 3100	C 55-57		
"	2.2 nF/500 V	CK 0200	C 68,69		
"	10 nF/500 V	CK 4100	C 47,48		
"	2.7 pF/400 V	CK 0270	C 33		
"	10 pF/400 V	CK 1100	C 51,44		
"	39 pF/400 V	CK 1390	C 34		
"	47 pF/400 V	CK 1470	C 35,36		
"	68 pF/400 V	CK 1680	C 37		
"	140 pF/400 V	CK 2140	C 39		
"	150 pF/400 V	CK 2150	C 38		
"	200 pF/400 V	CK 0078	C 52,53		
"	2 nF/125 V	CK 0082	C 30,31		
"	47 nF/ 30 V	CK 3471	C 79-123		
Paper	5 nF/300 V	CP 9000	C 127		
Polyester	2 μ F/250 V	C5 0028	C 137,138		
"	0.1 μ F/160 V	C5 0013	C 130		
"	1 μ F/160 V	C5 0025	C 132-135		
Trolitul	33 pF/125 V	CT 0502	C 152		
"	100 pF/125 V	CT 0500	C 140		
"	220 pF/125 V	CT 0501	C 142-150		
"	400 pF/125 V	CT 1011	C 40-43		
Trimmer	0.5 - 2.5 pF/500 V	CV 0021	C 163		
"	0.8 - 6 pF/400 V	CV 0112	C 165-167		
"	10 - 40 pF/250 V	CV 0019	C 50		
"	4.5 - 20 pF/160 V	CV 0020	C 160,161		
"	3.5 - 25 pF	CV 3011	C 170		
SWITCHES:					
Power Switch		OR 2006	O 4		
Meter and LS Switch		OS 2006	O 2		
Voltage Range		OU 2006	O 3		
Bandwidth		OT 2006	O 1		
Light		NT 1775	N 5		
POTENTIOMETERS:					
Meter and LS Adj.	carbon 1 M Ω lin.+ 50 K Ω log. + switch	PO 0001	P 8		
Carrier Adj.	carbon 1 M Ω lin.	PP 5108	P 10		
Trimmer Pot.	wire 10 K Ω lin.	PG 3104	P 2-4		
Trimmer Pot.	carbon 50 K Ω lin.	PG 3502	P 6		
RECTIFIERS:					
Germanium Diode	100 V/ 10 mA	QV 0021	Q 5		
"	8 V/ 30 mA	QV 0095	Q 24,25		
"	45 V/100 mA	QV 0079	Q 14-20		
"	25 V/110 mA	QV 0094	Q 22		
Silicon Diode	1000 V/o.15 A	QV 0023	Q 10-13		
"	200 V/ 40 mA	QV 0022	Q 7,8		
"	50 V/o.6 A	QV 0501	Q 27-29		
"	200 V/o.6 A	QV 0502	Q 31,32		
Zener Diode	5.5 V/ 5 mA	QV 1105	Q 34-36		
"	6.8 V/ 30 mA	QV 1106	Q 40-43		
RESISTORS:					
Carbon Film	5.5 W 10%	RK 22 Ω	R 110		
"	1/3 W 10%	RK 6.3 Ω	R 3,4		
"	"	RK 40 Ω	R 10,11,99		
"	"	RK 75 Ω	R 14,15		
"	"	RK 100 Ω	R 17-19		
"	"	RK 130 Ω	R 20		
"	"	RK 300 Ω	R 21,22		
"	"	RK 330 Ω	R 23		
"	"	RK 335 Ω	R 24,25		
"	"	RK 500 Ω	R 26,27,29,30		
"	"	RK 1 k Ω	R 32-42,28		
"	"	RK 1.5 k Ω	R 44,45		
"	"	RK 2 k Ω	R 46		
"	"	RK 3 k Ω	R 47,48,49		
"	"	RK 3.4 k Ω	R 50		
"	"	RK 4 k Ω	R 51-53		
"	"	RK 5 k Ω	R 55-63,84		
"	"	RK 6 k Ω	R 64		
"	"	RK 8 k Ω	R 65		
"	"	RK 10 k Ω	R 66-68		
"	"	RK 12 k Ω	R 69,70		
"	"	RK 13 k Ω	R 71,72		
"	"	RK 14.5 k Ω	R 73		
"	"	RK 18 k Ω	R 74,75		
"	"	RK 30 k Ω	R 85-87		
"	"	RK 40 k Ω	R 88-92		
"	"	RK 90 k Ω	R 93		
"	"	RK 275 k Ω	R 94,95		
"	"	RK 500 k Ω	R 96		
"	"	RK 1M Ω	R 97		
"	"	RK 4M Ω	R 98		
"	5%	RK 30 Ω	R 5-9		
"	"	RK 50 Ω	R 12,13		
"	"	RK 5 k Ω	R 54		
"	1%	RK 1.2 k Ω	R 43		
"	2%	RK 80 Ω	R 16		
"	10% 0.2 W	RK 10 Ω	R 106		
"	"	RK 27 Ω	R 2		
"	"	RK 150 Ω	R 1,100,120		
"	"	RK 4.7M Ω	R 105		
TUBE, TRANSISTORS:					
Wideband-Triode	EC 1000	VA 0078	V 50		
Germanium Transistor	AF 139	VB 0033	V 11-19		
"	AFY 37	VB 0034	V 10,20		
"	ASY 27-29	VB 0025	V 3,4		
"	2N 502A	VB 0035	V 21		
"	2N 554	VB 0023	V 1,2		
"	2N 2374	VB 1022	V 22-27		
Silicone Transistor	BC 107	VB 0032	V 5-9		
Fuse	0.2A	VF 0012	V 40		
Meter Lamp	6.3 V/o.5A	VS 1273	V 41,42		
Neon Lamp	110 V	VS 8001	V 43		
PRINTED CIRCUIT:					
IF and AF Amplifier		XC 0212			
Power Supply		XC 0214			
Mixer		XC 0215			
Emitter Follower		XC 0217			
Printed circuit	XC 0212 with comp.	2006 bl. 800			
"	XC 0214	2006 bl. 801			
"	XC 0215	2006 bl. 812			
"	XC 0217	ZE 0007			

COMPONENT TYPE	STOCK REFERENCE	CIRCUIT DIAGRAM REF.
<u>COILS:</u>		
Oscillator	o.1 - 6.5 MHz	ZS 0065 1
"	6 - 15 MHz	ZS 0066 2
"	15 - 30 MHz	ZS 0067 3
"	30 - 50 MHz	ZS 0068 4
"	50 - 84 MHz	ZS 0069 5
"	84 - 135 MHz	ZS 0070 6
"	135 - 230 MHz	ZS 0089 7
Mixer		ZS 0087
1 and 2 IF Amp.		ZS 0080
3 IF Amp.		ZS 0086
Discriminator		ZS 0079
Ref.Osc.		ZS 0085
Choke	30 μ H	LJ 0008 L 2-17,19-21
"	14 μ H	LJ 0009 L 18
Filter		LB 0556 L 25
"		LB 0557 L 26
"		LB 0558 L 27
D.C. Converter		LB 0559 T 2
<u>MISCELLANEOUS:</u>		
Power Cord. EUR		AN 0005
Power Cord. USA		AN 0006
Moving coil meter		IM 2501
BNC Coaxial Jack 75 Ω		JP 0032
Twinax Jack		JP 0033
6 Pole Jack		JP 4705
Coaxial cable with BNC Jacks		AO 0048
Coaxial Jack for connection BNC		
and cathode follower		JP 0029
BNC Coaxial plug 75 Ω		JJ 0121
Twinax plug (probe power)		JJ 0202
6 pole plug		JJ 4704
Test probe		UA 0124
Reduction drive		UF 0001
Frequency drive cord.		DX 0003
Cabinet, wood		KA 2006
Cabinet, metal		KQ 0023
Bakelite knob 25 mm		SN 0701
Bakelite knob 30 mm		SN 0814
Bakelite knob 50 mm		SN 1003
Loudspeaker		HP 0014
Power Transformer		TN 9191
Cathode Follower		ZC 0006
Attenuator		ZF 0003

CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REFERENCE	CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REFERENCE
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RESISTORS:

R	Carbon Film	1/3 W	5%	30 Ω
R 7-9	"	"	10%	40 Ω
R 10,11	"	"	5%	50 Ω
R 12,13	"	"	5%	75 Ω
R 14,15	"	"	10%	75 Ω
R 16	"	"	1%	87 Ω
R 17-19	"	"	10%	100 Ω
R 20	"	"	"	130 Ω
R 21,22	"	"	"	300 Ω
R 23	"	"	"	330 Ω
R 24,25	"	"	"	335 Ω
R 26,27	"	"	"	500 Ω
R 28	"	"	"	1 kΩ
R 29,30	"	"	"	500 Ω
R 31	"	"	2%	525 Ω
R 32-42	"	"	10%	1 kΩ
R 44,45	"	"	"	1,5 kΩ
R 46	"	"	"	2 kΩ
R 47,49	"	"	"	3 kΩ
R 50	"	"	"	3,4 kΩ
R 51-53	"	"	"	4 kΩ
R 54-63	"	"	"	5 kΩ
R 64	"	"	"	6 kΩ
R 65	"	"	"	8 kΩ
R 66-68	"	"	"	10 kΩ
R 69,70	"	"	"	12 kΩ
R 71,72	"	"	"	13 kΩ
R 73	"	"	"	14,5 kΩ
R 74,75	"	"	"	18 kΩ
R 76-83	"	"	"	25 kΩ
R 85-87	"	"	"	30 kΩ
R 88	"	"	"	40 kΩ
R 91,92	"	"	"	25 kΩ
R 93	"	"	"	63 kΩ
R 94	"	"	"	275 kΩ
R 96	"	"	"	500 kΩ
R 98	"	"	"	4 MΩ
R 99	"	"	"	50 Ω
R 100	"	0.2 W	"	150 Ω
R 105	"	"	"	4,7 MΩ
R 106	"	"	"	27 Ω
R 110	"	5.5 W	"	22 Ω
R 120	"	0.2 W	"	4,7 MΩ
R 195	"	1/3 W	"	225 kΩ
R 200	"	"	"	200 Ω
R 210	"	"	"	10 Ω

TUBE, TRANSISTORS:

V 1,2	Germanium Transistor	2N554	VB 0023
V 3	"	2N554	VB 0023
V 10	"	2N554	VB 0023
V 10-9	Silicon	BC 107	VB 0032
V 11-19	Germanium	AFY 37	VB 0033
V 20	"	AFY 139	VB 0034
V 21	"	AFY 37	VB 0034
V 22, 23, 25	"	2N5024	VB 0035
V 28, 29	"	2N237A	VB 0022
V 39	Fuse	40310	VB 0256
V 40	"	2 A	VF 0010
V 41, 42	"	0.2 A	VF 0012
V 43	Meter Lamp	6.3 V/o. 5 A	VS 1273
V 43	Neon Lamp	110 V	VS 8001
V 50	Wideband-Triode	EC 1000	VA 0078

PRINTED CIRCUIT:

Emitter Follower	XC 0217
IF and AF Amplifier	XC 0212
Mixer	XC 0215
Power Supply	XC 0309
XC 0217 with components	ZE 0007
XC 0212 " "	8002006
XC 0215 " "	8122006
XC 0309 " "	8012006

COILS:

1	Oscillator	0.1 - 6,5 MHz	ZS 0065
2	"	6 - 15 MHz	ZS 0066
3	"	15 - 30 MHz	ZS 0067
4	"	30 - 50 MHz	ZS 0068

CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REFERENCE
<u>COILS:</u>		
5	Oscillator 50 - 84 MHz	ZS 0069
6	" 84 - 135 MHz	ZS 0070
7	" 135 - 230 MHz	ZS 0089
L 2, 4-17	Choke 30 μ H	LJ 0008
L 19-21	" 30 μ H	LJ 0008
L 25	Filter	LB 0556
L 26	"	LB 0557
L 27	"	LB 0558
T 2	DC Converter	LB 0559
	1 and 2 Amplifier	ZS 0080
	3 IF Amplifier	ZS 0086
	Discriminator	ZS 0079
	Mixer	ZS 0087
	Ref. Oscillator	ZS 0085

MISCELLANEOUS:

Attenuator	ZF 0003
Bakelite knob 25 mm	SN 0701
Bakelite knob 30 mm	SN 0814
Bakelite knob 50 mm	SN 1003
Cabinet, metal	KQ 0023
Cabinet, wood	KA 2006
Cathode Follower	ZC 0006
Coaxial cable with BNC jacks	AO 0048
Frequency drive cord.	DX 0003
Jack, BNC Coaxial, 75 Ω	JP 0032
Jack, Coaxial for connection BNC and Cathode follower	JP 0029
Jack, Twinax	JP 0033
Jack, 6 pole	JP 4705
Loudspeaker	HP 0014
Meter, moving coil	IM 2501
Plug, BNC coaxial, 75 Ω	JJ 0121
Plug, Twinax (probe power)	JJ 0202
Plug, 6 pole	JJ 4704
Power Cord. EUR	AN 0005
Power Cord. USA	AN 0006
Power Transformer	TN 9191
Reduction drive	UF 0001
Test Probe	UA 0124

CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REFERENCE
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CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REFERENCE	CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REFERENCE
<u>CAPACITORS:</u>				<u>RECTIFIERS:</u>			
C 2-5	Electrolytic	100 µF/ 15 V	CE 0310	Q 5	Germanium diode	100 V/ 10 mA	QV 0021
C 7-10	"	2 µF/ 70 V	CE 0401	Q 7,8	Silicon	200 V/ 40 mA	QV 0022
C 11	"	8 µF/ 40 V	CE 0414	Q 9	"	50 V/ 0,6 A	QV 0501
C 12	"	2 x 1000 µF/ 25 V	CE 0411	Q 10-13	"	1200 V/ 0,15 A	QV 0025
C 13	"	64 µF/ 64 V	CE 0513	Q 15-20	Germanium	45 V/ 100 mA	QV 0079
C 15-17	"	250 µF/ 25 V	CE 0413	Q 22	"	25 V/ 110 mA	QV 0094
C 20-25	"	50 µF/ 25 V	CE 8965	Q 24	Silicon	200 V/ 40 mA	QV 0022
C 30,31	Ceramic	2 nF/125 V	CK 0082	Q 25	Germanium	108 V/ 30 mA	QV 0099
C 32	"	75 pF/500 V	CK 0101	Q 27-29	Silicon	50 V/ 0,6 A	QV 0501
C 33	"	2,7 pF/400 V	CK 0270	Q 31,32	"	200 V/ 0,6 A	QV 0502
C 34	"	39 pF/400 V	CK 1390	Q 34-35	Zener	5,5 V/ 40 mA	QV 1105
C 35,36	"	47 pF/400 V	CK 1470	Q 40	Stabistor	6 V/ 150 mA	QV 1400
C 37	"	68 pF/400 V	CK 1680	Q 41,42	Zener	6,8 V/ 30 mA	QV 1106
C 38	"	150 pF/400 V	CK 2150	Q 43	"	6,2 V/ 34 mA	QV 1322
C 39	"	140 pF/400 V	CK 2140				
C 40	Trolitul	400 pF/125 V	CT 1011	<u>RESISTORS:</u>			
C 41	Ceramic	470 pF/250 V	CK 2471	R 1	Carbon Film	0,2 W 10% 150 Ω	
C 42,43	Trolitul	400 pF/125 V	CT 1011	R 2	"	" 27 Ω	
C 44	Ceramic	10 pF/400 V	CK 1100	R 3,4	"	1/3 W 6,3 Ω	
C 47,48	"	10 nF/500 V	CK 4100	R 5	"	5% 30 Ω	
C 51	"	10 pF/400 V	CK 1100	R 6	"	" 10 Ω	
C 52,53	"	200 pF/400 V	CK 0078	R 7-9	"	" 30 Ω	
C 54	"	500 pF/500 V	CK 0083	R 10,11	"	10% 40 Ω	
C 55-57	"	1 nF/125 V	CK 3100	R 12,13	"	5% 50 Ω	
C 59,60	Trimmer	5 nF/125 V	CK 0096	R 14	"	10% 75 Ω	
C 68,69	Ceramic	2,2 nF/500 V	CK 0200	R 15	"	" 315 Ω	
C 79-81	"	47 nF/ 30 V	CK 4470	R 16	"	1% 87 Ω	
C 82	"	0,47 µF/ 12 V	CK 5470	R 17-19	"	10% 100 Ω	
C 83-120	"	47 nF/ 30 V	CK 4470	R 20	"	" 130 Ω	
C 122	"	380 pF/250 V	CK 2390	R 21,22	"	" 300 Ω	
C 123	"	47 nF/ 30 V	CK 4470	R 23	"	" 330 Ω	
C 125,126	Polyester	0,47 µF/250 V	CS 0021	R 24,25	"	" 335 Ω	
C 127	Paper	5 nF/300 V	CP 9000	R 26,27	"	" 500 Ω	
C 128,129	Polyester	10 nF/250 V	CS 0001	R 28	"	" 1 kΩ	
C 130	"	0,1 µF/160 V	CS 0013	R 29,30	"	" 500 Ω	
C 132,134	"	1 µF/160 V	CS 0025	R 31	"	2% 525 Ω	
C 137	Electrolytic	64 µF/ 64 V	CE 0513	R 32-42	"	10% 1 kΩ	
C 140	Trolitul	100 pF/125 V	CT 0500	R 43	"	2% 1,2 kΩ	
C 142-150	"	220 pF/125 V	CT 0501	R 44,45	"	10% 1,5 kΩ	
C 152	"	33 pF/125 V	CT 0502	R 46	"	" 2 kΩ	
C 160,161	Trimmer	4,5-20 pF/160 V	CV 0020	R 47	"	5% 3,5 kΩ	
C 163	"	0,5-2,5 pF/500 V	CV 0021	R 48,49	"	" 3 kΩ	
C 165-167	"	0,8-6 pF/400 V	CV 0112	R 50	"	" 3,4 kΩ	
C 168	"	0,7-3 pF/1000 V	CV 0113	R 51-53	"	" 4 kΩ	
C 170	"	3,5-25 pF/650 V	CV 3011	R 54-63	"	" 5 kΩ	
C 241	Ceramic	470 pF/400 V	CK 2470	R 64	"	" 6 kΩ	
				R 65	"	" 8 kΩ	
<u>SWITCHES:</u>				R 66-68	"	" 10 kΩ	
N 5	Light		NT 1775	R 69,70	"	" 12 kΩ	
O 1	Bandwidth		OT 2006	R 71,72	"	" 13 kΩ	
O 2	Meter and LS switch		OS 2006	R 73	"	" 14,5 kΩ	
O 3	Voltage Range		OU 2006	R 74,75	"	" 18 kΩ	
O 4	Power On-Off		OR 2006	R 76-83	"	" 25 kΩ	
				R 85-87	"	" 30 kΩ	
				R 88-90	"	" 40 kΩ	
				R 91,92	"	" 25 kΩ	
<u>POTENTIOMETERS:</u>				R 93	"	" 63 kΩ	
P 2-4	Trimmer wire	10 kΩ lin	PG 3104	R 94	"	" 275 kΩ	
P 7	" carbon	150 kΩ lin	PG 4151	R 96	"	" 500 kΩ	
P 8	Meter and LS Adj. carbon	1 MΩ lin + 50 kΩ log +		R 98	"	" 4 MΩ	
		Switch	PO 0001	R 99	"	" 50 Ω	
P 10	Carrier Adj. carbon	1 MΩ lin	PP 5103	R 100	"	0,2 W 150 Ω	
				R 105	"	" 4,7 MΩ	
				R 106	"	" 27 Ω	

CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REFERENCE	CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REFERENCE
<u>RESISTORS:</u>				<u>MISCELLANEOUS:</u>			
R 110	"	" 5.5 W	" 22 Ω		Attenuator		ZF 0003
R 120	"	" 0.2 W	" 4,7 M Ω		Bakelite knob 25 mm		SN 0701
R 195	"	" 1/3 W	" 225 k Ω		Bakelite knob 30 mm		SN 0814
R 200	"	" "	" 200 Ω		Bakelite knob 50 mm		SN 1003
R 210	"	" "	" 10 k Ω		Batteries		QB 0008
R 220	"	" "	" 1 k Ω		Cabinet, metal		KQ 0023
<u>TUBE, TRANSISTORS:</u>					Cabinet, wood		KA 2006
V 1,2	Germanium Transistor	2N554	VB 0023		Cathode Follower		ZC 0006
V 3,4	"	ASY 27-29	VB 0025		Coaxial cable with BNC jacks		AO 0048
V 5-9	Silicon	BC 107	VB 0032		Frequency drive cord.		DX 0003
V 10	Germanium	AFY 37	VB 0034		Jack, BNC Coaxial, 75 Ω		JP 0032
V 11-19	"	AF 139	VB 0033		Jack, Coaxial for connection BNC and Cathode follower		JP 0029
V 20	"	AFY 37	VB 0034		Jack, Twinax		JP 0033
V 21	"	2N502A	VB 0035		Jack, 6 pole		JP 4705
V 22,23,25	"	2N2374	VB 1022		Loudspeaker		HP 0014
V 28,29	"	40310	VB 0256		Meter, moving coil		IM 2501
V 39	Fuse	2 A	VF 0010		Plug, BNC coaxial, 75 Ω		JJ 0121
V 40	"	0.2 A	VF 0012		Plug, Twinax (probe power)		JJ 0202
V 41,42	Meter Lamp	6.3 V/0.25 A	V5 1273		Plug, 6 pole		JJ 4704
V 43	Neon Lamp	110 V	VS 8001		Power Cord. EUR		AN 0005
V 50	Wideband-Triode	EC 1000	VA 0078		Power Cord. USA		AN 0006
<u>PRINTED CIRCUIT:</u>					Power Transformer		TN 9191
	Emitter Follower		XC 0217		Reduction drive		UF 0001
	IF and AF Amplifier		XC 0212		Test Probe		UA 0124
	Mixer		XC 0215				
	Power Supply		XC 0309				
	XC 0217 with components		ZE 0007				
	XC 0212 "	"	8002006				
	XC 0215 "	"	8122006				
	XC 0309 "	"	8012006				
<u>COILS:</u>							
1	Oscillator	0.1 - 6 MHz	ZS 0065				
2	"	6 - 15 MHz	ZS 0066				
3	"	15 - 30 MHz	ZS 0067				
4	"	30 - 50 MHz	ZS 0068				
5	"	50 - 84 MHz	ZS 0069				
6	"	84 - 135 MHz	ZS 0070				
7	"	135 - 230 MHz	ZS 0089				
L 2,4-21	Choke	30 μ H	LJ 0008				
L 25	Filter	30 μ H	LB 0556				
L 26	"		LB 0557				
L 27	"		LB 0558				
T 2	DC Converter		LB 0559				
	1 and 2 Amplifier		ZS 0080				
	3 IF Amplifier		ZS 0086				
	Discriminator		ZS 0079				
	Mixer		ZS 0087				
	Ref. Oscillator		ZS 0085				

valid from serial no. 222631

CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REFERENCE	CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REFERENCE
CAPACITORS:				RECTIFIERS:			
C 2-5	Electrolytic	100 µF/ 15 V	CE 0310	Q 5	Germanium diode	100 V/ 10 mA	QV 0021
C 7-10	"	2 µF/ 70 V	CE 0401	Q 7,8	Silicon	200 V/ 40 mA	QV 0022
C 11	"	8 µF/ 40 V	CE 0414	Q 9	"	50 V/ 0,6 A	QV 0501
C 12	"	2 x 1000 µF/ 25 V	CE 0411	Q 10-13	"	1200 V/ 0,15 A	QV 0025
C 13	"	64 µF/ 64 V	CE 0513	Q 15-20	Germanium	45 V/ 100 mA	QV 0079
C 15-17	"	250 µF/ 25 V	CE 0413	Q 22	"	25 V/ 110 mA	QV 0094
C 20-25	"	50 µF/ 25 V	CE 8965	Q 24	Silicon	200 V/ 40 mA	QV 0022
C 30,31	Ceramic	2 nF/125 V	CK 0082	Q 25	Germanium	108 V/ 30 mA	QV 0099
C 32	"	100 pF/400 V	CK 0077	Q 27-29	Silicon	50 V/ 0,6 A	QV 0501
C 33	"	2,7 pF/400 V	CK 0270	Q 31,32	"	200 V/ 0,6 A	QV 0502
C 34	"	39 pF/400 V	CK 1390	Q 34	Zener	6,2 V/ 34 mA	QV 1322
C 35	"	68 pF/400 V	CK 1680	Q 35	"	5,5 V/ 40 mA	QV 1105
C 36	"	60 pF/400 V	CK 1600	Q 40	Stabistor	6 V/ 150 mA	QV 1400
C 37	"	80 pF/400 V	CK 1800	Q 41,42	Zener	6,8 V/ 30 mA	QV 1106
C 38	"	200 pF/400 V	CK 0078	Q 43	"	6,6 V/ 10 mA	QV 1008
C 39	"	140 pF/400 V	CK 2140				
C 40	Trolitul	400 pF/125 V	CT 1011				
C 41	Ceramic	330 pF/400 V	CK 2331	RESISTORS:			
C 42	Trolitul	400 pF/125 V	CT 1011	R 1	Carbon Film	0,2 W 10%	150 Ω RA 0001
C 43	Ceramic	470 pF/400 V	CK 2471	R 2	"	" 27 Ω	RA 0006
C 44	"	10 pF/400 V	CK 1100	R 3,4	"	1/3 W 6,3 Ω	
C 47-48	"	10 pF/500 V	CK 4100	R 5-9	"	5% 30 Ω	
C 51	"	10 pF/400 V	CK 1100	R 10,11	"	10% 40 Ω	
C 52,53	"	200 pF/400 V	CK 0078	R 12,13	"	5% 50 Ω	
C 54	"	500 pF/500 V	CK 0083	R 14	"	10% 75 Ω	
C 55-57	"	1 nF/500 V	CK 3100	R 15	"	315 Ω	
C 59,60	"	5 nF/125 V	CK 0096	R 16	"	1% 87 Ω	
C 68,69	"	2,2 nF/500 V	CK 0200	R 17-19	"	10% 100 Ω	
C 79-81	"	47 nF/ 30 V	CK 4470	R 20	"	130 Ω	
C 82	"	0,47 µF/ 12 V	CK 5470	R 21,22	"	300 Ω	
C 83-120	"	47 nF/ 30 V	CK 4470	R 23	"	330 Ω	
C 122	"	390 pF/400 V	CK 2390	R 24,25	"	335 Ω	
C 123	"	47 nF/ 30 V	CK 4470	R 26,27	"	500 Ω	
C 125,126	Polyester	0,47 µF/250 V	CS 0021	R 28	"	1 kΩ	
C 127	Paper	5 nF/300 V	CP 9000	R 29,30	"	500 Ω	
C 128,129	Polyester	10 nF/250 V	CS 0001	R 31	"	525 Ω	
C 130	"	0,1 µF/160 V	CS 0013	R 32-42	"	10% 1 kΩ	
C 132,134	"	1 µF/160 V	CS 0025	R 43	"	2% 1,2 kΩ	
C 137	Electrolytic	64 µF/ 64 V	CE 0513	R 44,45	"	10% 1,5 kΩ	
C 140	Trolitul	100 pF/125 V	CT 0500	R 46	"	2 kΩ	
C 142	Ceramic	200 pF/400 V	CK 0078	R 47	"	5% 3,5 kΩ	
C 143-149	Trolitul	220 pF/125 V	CT 0501	R 48,49	"	3 kΩ	
C 150	"	400 pF/125 V	CT 1011	R 50	"	3,4 kΩ	
C 152	"	33 pF/125 V	CT 0502	R 51-53	"	4 kΩ	
C 160,161	Trimmer	4,5-20 pF/160 V	CV 0020	R 54-63	"	5 kΩ	
C 163	"	0,5-2,5 pF/500 V	CV 0021	R 64	"	6 kΩ	
C 165-167	"	0,8-6 pF/400 V	CV 0112	R 65	"	8 kΩ	
C 168	"	0,7-3 pF/1000 V	CV 0113	R 66-68	"	10 kΩ	
C 170	"	3,5-25 pF/650 V	CV 3011	R 69,70	"	12 kΩ	
C 180	Ceramic	1,8 pF/400 V	CK 0180	R 71,72	"	13 kΩ	
C 181	"	2,7 pF/400 V	CK 0270	R 73	"	14,5 kΩ	
C 241	"	470 pF/400 V	CK 2470	R 74,75	"	18 kΩ	
SWITCHES:				R 76-83	"	25 kΩ	
N 5	Light		NT 0023	R 85-87	"	30 kΩ	
O 1	Bandwidth		OT 2006	R 88-90	"	40 kΩ	
O 2	Meter and LS switch		OS 2006	R 91,92	"	25 kΩ	
O 3	Voltage Range		OU 2006	R 93	"	63 kΩ	
O 4	Power Switch		OR 2006	R 94	"	275 kΩ	
				R 96	"	500 kΩ	
				R 98	"	4 MΩ	
POTENTIOMETERS:				R 99	"	50 Ω	
P 2-4	Trimmer wire	10 kΩ lin	PG 3104	R 100	"	150 Ω	
P 7	" carbon	150 kΩ lin	PG 4151	R 105	"	4,7 MΩ	
P 8	Meter and LS Adj.	1 MΩ lin + 50 kΩ log + Switch	PO 0002	R 106	"	27 Ω	
			PP 5103				
P 10	Carrier Adj.	1 MΩ lin					

CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REFERENCE	CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REFERENCE
<u>RESISTORS:</u>			<u>MISCELLANEOUS:</u>		
R 110	Wire	5,5 W 10% 22 Ω	RX 0311	Attenuator	ZF 0003
R 120	Carbon Film	0,2 W " 4,7 MΩ	RA 0006	Bakelite knob 25 mm	SN 0701
R 195	" "	1/3 W " 225 kΩ		Bakelite knob 30 mm	SN 0814
R 200	" "	" " 200 Ω		Bakelite knob 50 mm	SN 1003
R 210	" "	" " 10 kΩ		Batteries	QB 0008
R 220	" "	" " 1 kΩ		Cabinet, metal	KQ 0023
<u>TUBE, TRANSISTORS:</u>				Cabinet, wood	KA 2006
V 1,2	Germanium Transistor	2N554	VB 0023	Cathode Follower	ZC 0006
V 3,4	" "	ASY 27-29	VB 0025	Coaxial cable with BNC jacks	AO 0048
V 5-9	Silicon	BC 107	VB 0032	Frequency drive cord.	DX 0003
V 10	Germanium	AFY 37	VB 0034	Jack, BNC Coaxial, 75 Ω	JP 0032
V 11-19	" "	AF 139	VB 0033	Jack, Coaxial for connection	
V 20	" "	AFY 37	VB 0034	BNC and Cathode follower	JP 0029
V 21	" "	2N502A	VB 0035	Jack, Twinax	JP 0033
V 22,23,25	" "	2N2374	VB 1022	Jack, 6 pole	JP 4705
V 28,29	Silicon	40310	VB 0256	Loudspeaker	HP 0014
V 39	Fuse	2 A	VF 0010	Meter, moving coil	IM 2501
V 40	" "	0.2 A	VF 0012	Narrow Band Filter 11.3 MHz	ZU 0002
V 41,42	Meter Lamp	6.3 V/0.25 A	VS 1273	Plug, BNC coaxial, 75 Ω	JJ 0121
V 43	Neon Lamp	110 V	VS 8001	Plug, twinax (probe power)	JJ 0202
V 50	Wideband-Triode	EC 1000	VA 0078	Plug, 6 pole	JJ 4704
<u>PRINTED CIRCUIT:</u>				Power Cord. EUR	AN 0005
	Emitter Follower	XC 0217		Power Cord. USA	AN 0006
	IF and AF Amplifier	XC 0212		Power Transformer	TN 9191
	Mixer	XC 0215		Reduction drive	UF 0001
	Power Supply	XC 0309		Test Probe	UA 0124
	XC 0217 with components	ZE 0007			
	XC 0212 " "	8002006			
	XC 0215 " "	8122006			
	XC 0309 " "	8012006			
<u>COILS:</u>					
1	Oscillator	0.1 - 6 MHz	ZS 0065		
2	"	6 - 15 MHz	ZS 0066		
3	"	15 - 30 MHz	ZS 0067		
4	"	30 - 50 MHz	ZS 0068		
5	"	50 - 84 MHz	ZS 0069		
6	"	84 - 135 MHz	ZS 0070		
7	"	135 - 230 MHz	ZS 0089		
L 2,4-21	Choke	30 μH	LJ 0008		
L 25	Filter	30 μH	LB 0556		
L 26	"		LB 0557		
L 27	"		LB 0558		
T 2	DC Converter		LB 0559		
	1 and 2 Amplifier		ZS 0080		
	3 IF Amplifier		ZS 0086		
	Discriminator		ZS 0079		
	Mixer		ZS 0087		
	Ref. Oscillator		ZS 0085		

O1: Bandwidth

- 1: Wide
- 2: Narrow

O2: Meter and LS Switch

- 1: Carrier AM LS
- 2: " FM LS
- 3: Mod. Adj.
- 4: " AM
- 5: " FM

O3: Voltage Range

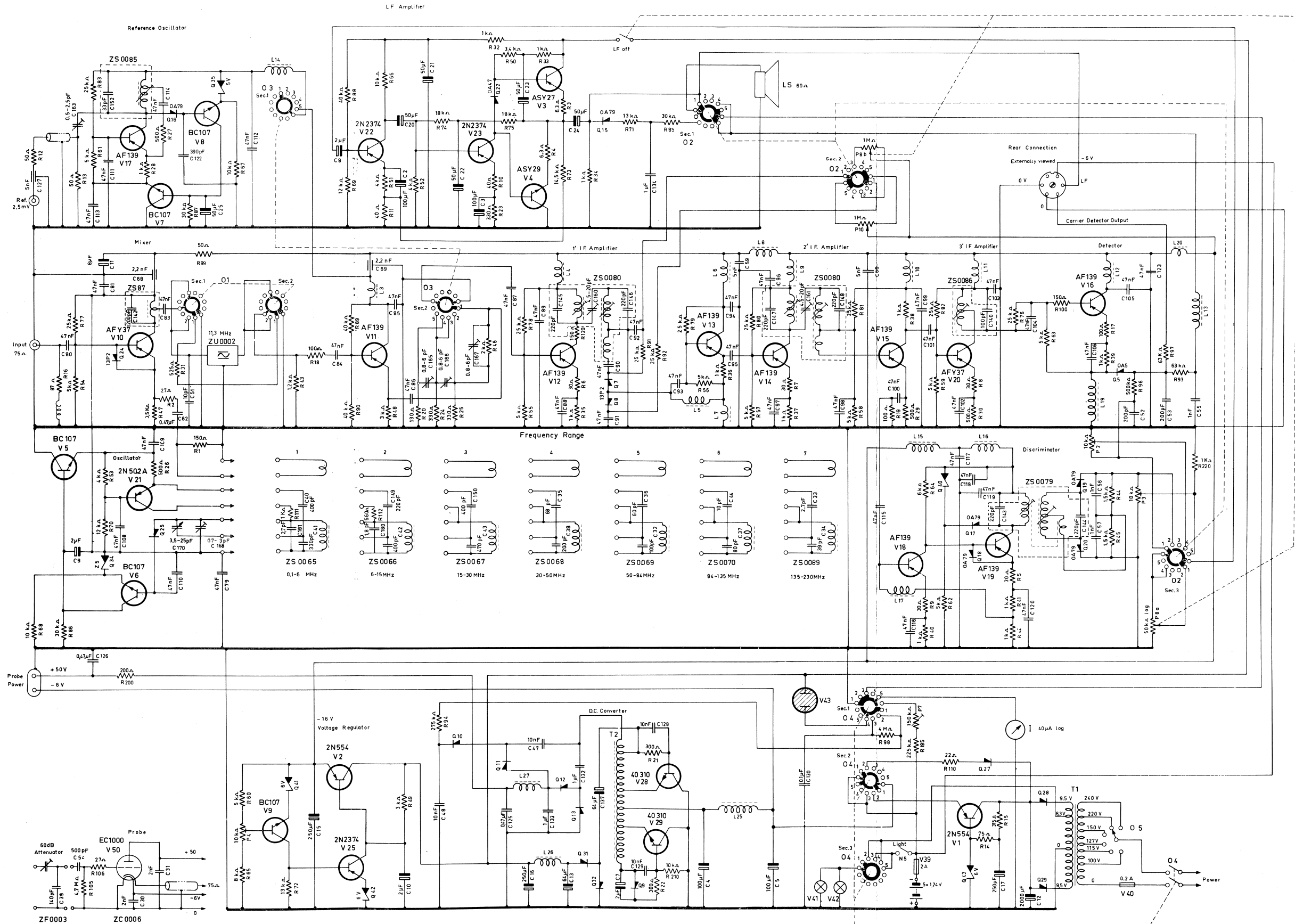
- 1: -100 dB 50 μ V
- 2: " 80 " 500 μ V
- 3: " 60 " 5 mV
- 4: " 40 " 50 mV
- 5: Ref.

O4: Power Switch

- 1: Off
- 2: Line
- 3: Batt.
- 4: Charge
- 5: Batt. Check

P8: LS and Mod. Adj.

P10: Carrier Adj.



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21-3-66	162809		
24-8-66	186066		

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Heterodyne Voltmeter
Type 2006

O1: Bandwidth

- 1: Wide
- 2: Narrow

O2: Meter and LS Switch

- 1: Carrier AM LS
- 2: " FM LS
- 3: Mod. Adj.
- 4: " AM
- 5: " FM

O3: Voltage Range

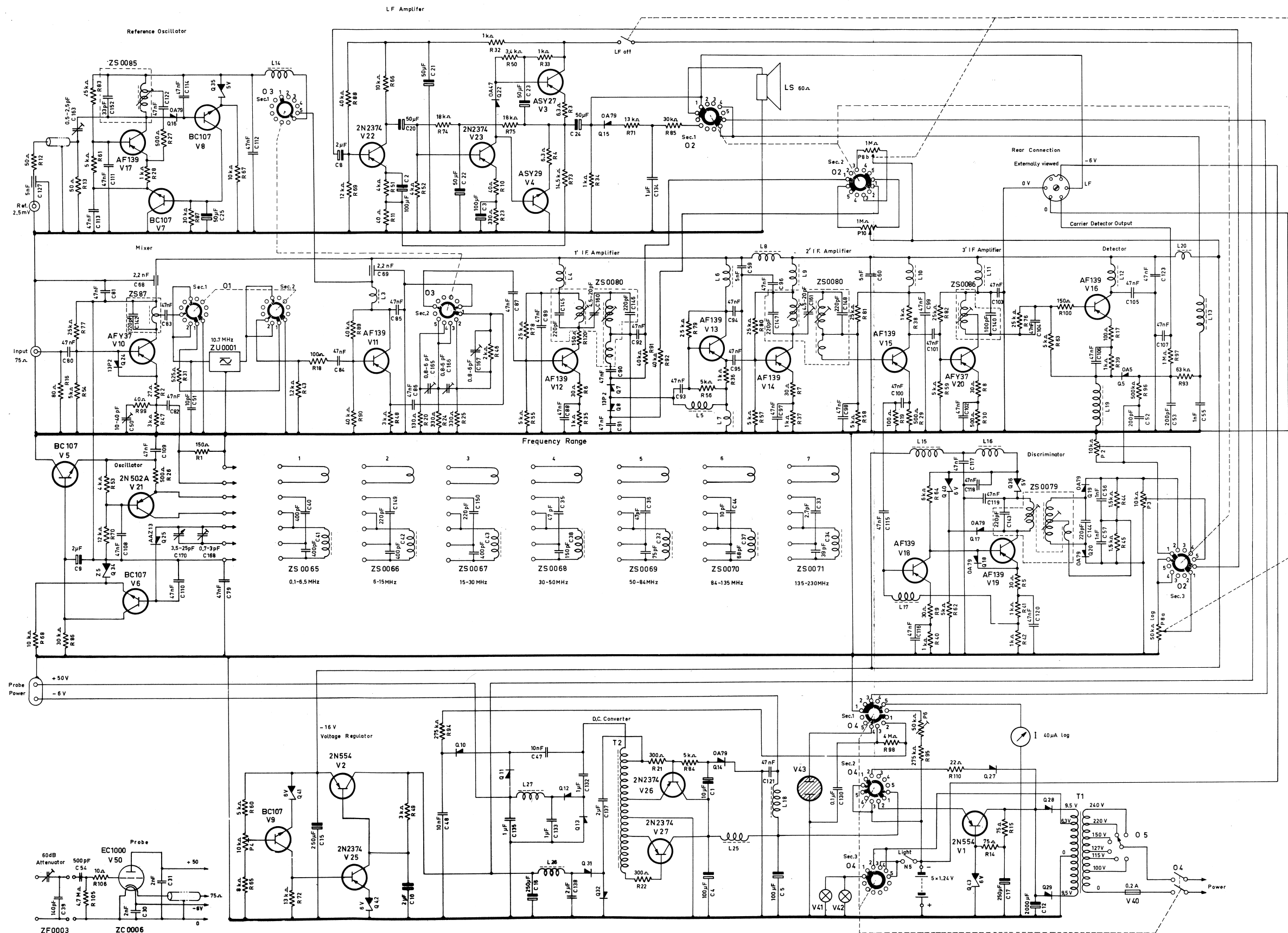
- 1: -100 dB 50 μ F
- 2: -80 = 500 μ F
- 3: -60 = 5 mV
- 4: -40 = 50 mV
- 5: Ref.

O4: Power Switch

- 1: Off
- 2: Line
- 3: Batt.
- 4: Charge
- 5: Batt. Check

P8: LS and Mod. Adj.

P10: Carrier Adj.



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Heterodyne Voltmeter
Type 2006

O1: Bandwidth

- 1: Wide
- 2: Narrow

O2: Meter and LS Switch

- 1: Carrier AM LS
- 2: " FM LS
- 3: Mod. Adj.
- 4: " AM
- 5: " FM

O3: Voltage Range

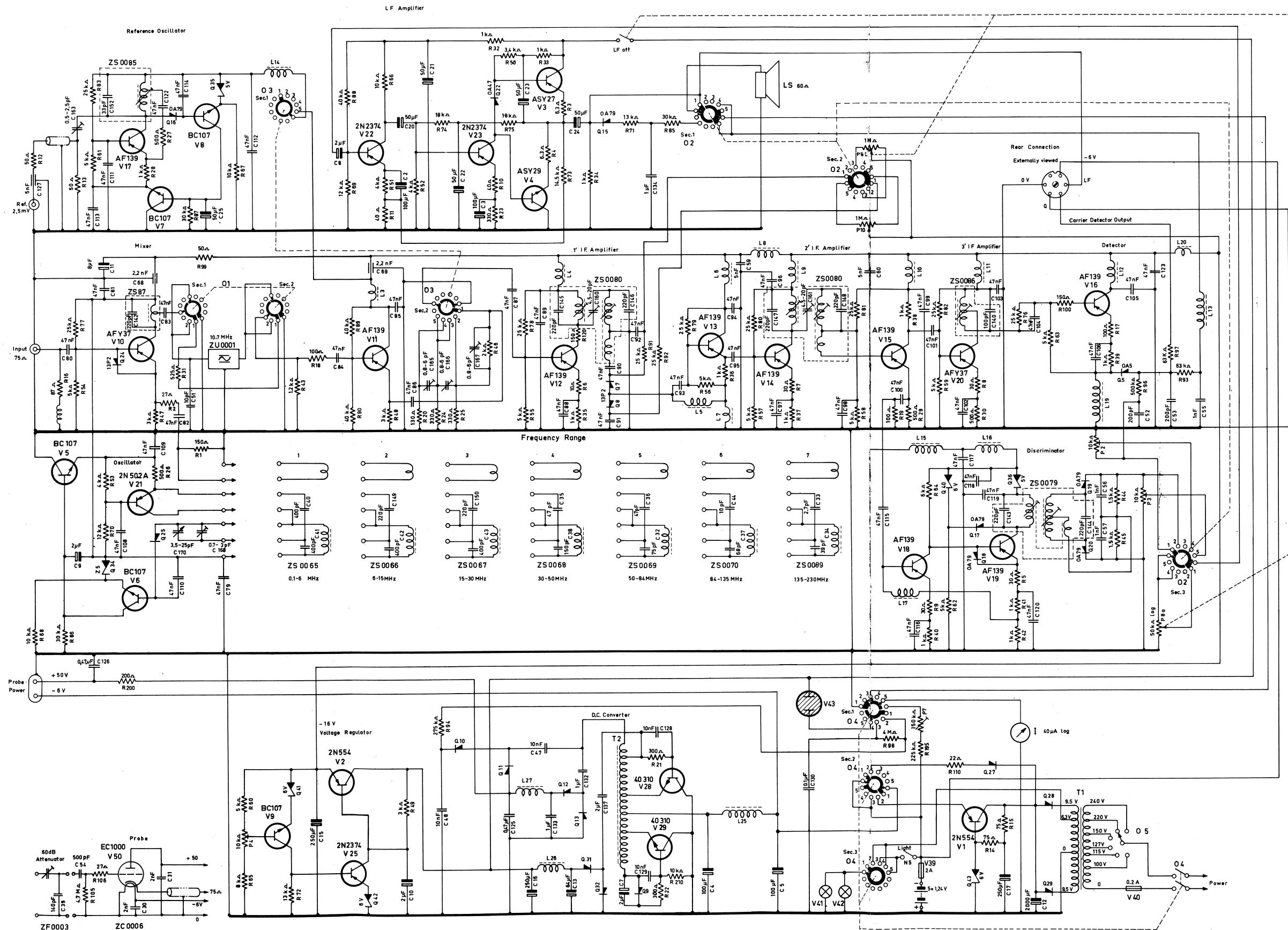
- 1: -100 dB 50 μ V
- 2: -80 = 500 μ V
- 3: -60 = 5 mV
- 4: -40 = 50 mV
- 5: Ref.

O4: Power Switch

- 1: Off
- 2: Line
- 3: Batt.
- 4: Charge
- 5: Batt. Check

P8: LS and Mod. Adj.

P10: Carrier Adj.



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21-3-66	162809

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Heterodyne Voltmeter
Type 2006

