

STORNOPHONE 5000
Maintenance Manual
Section 3

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Service Coordination

TECHNICAL SPECIFICATIONS

CQM5110

Guaranteed performance specifications unless otherwise noted.

Typical values are given in brackets.

GENERAL

Frequency Range

146 - 174 MHz

Channel Separation

CQM5112: 30/25kHz

CQM5113: 20kHz

CQM5114: 12.5kHz

Maximum Frequency Deviation

CQM5112: ± 5 kHz

CQM5113: ± 4 kHz

CQM5114: ± 2.5 kHz

Modulation Frequency Range

CQM5112: 300 - 3000Hz

CQM5113: 300 - 3000Hz

CQM5114: 300 - 2700Hz

Maximum RF Bandwidth

1.5MHz

Antenna Impedance

50 Ω

Maximum Number of Channels

6

Supply Voltage

Minimum : 10.8V

Nominal : 13.2V

Maximum : 16.6V

Negative potential to chassis

Temperature Range

-30 $^{\circ}$ C to +60 $^{\circ}$ C

Dimensions

B x D x H: 180 x 190 x 60mm

Weight

1.8 Kg

RECEIVER

Sensitivity

12dB SINAD (EIA), $\frac{1}{2}$ e. m. f.

0.3uV (0.23uV)

Measuring conditions:

Δf . $\pm 2/3 \times \Delta f$ max; $f_{\text{mod}} = 1$ kHz

20dB SINAD (CEPT) e. m. f.

CQM5112: 0.75uV (0.55uV)

CQM5113: 0.75uV (0.55uV)

CQM5114: 1.0uV (0.75uV)

Δf 60% $\times \Delta f$ max; $f_{\text{mod}} = 1$ kHz.

Measured with psophometric filter.

Crystal Frequency Range

45.1 – 54.5MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s - 10.7}{3} \text{MHz}$$

Frequency Stability

Conforms with government regulations

Modulation Acceptance Bandwidth (EIA)

CQM5112: ±7KHz (±7.5KHz)

Adjacent Channel Selectivity

EIA

CQM5112: 75dB (90dB)

FTZ

CQM5113: 70dB (88dB)

CEPT

CQM5112: 75dB (90dB)

CQM5114: 65dB (88dB)

Spurious Rejection

EIA

80dB (85dB)

Intermodulation Attenuation

EIA

CQM5112: 70dB (72dB)

CQM5113: 70dB (72dB)

CEPT

CQM5112: 70dB (75dB)

CQM5113: 70dB (75dB)

CQM5114: 70dB (73dB)

Blocking

90dB/uV (104dB/uV)

Radiation

CQM5112:

Conducted: max 0.8nW

CQM5113:

Radiated: max. 0.8nW

CQM5114:

Radiated: max. 0.8nW

AF Load Impedance (Loudspeaker)

4Ω

AF Power Output

EIA: 3W (3.6W)

CEPT: 1.5W

AF Distortion

5% (1.5%)

Δf=60% Δf max., 1KHz, 1W, RF 1mV

Audio Frequency Response

+1/-3dB (+0/-1.5dB)

Relative to 1000Hz, -6dB/octave

fm: CQM5112: 300 – 3000Hz

CQM5113: 300 – 3000Hz

CQM5114: 300 – 2600Hz

Hum and Noise

Squelched : 80dB (better than 85dB)

Unsquelched : 55dB (60dB)

Squelch Recovery Time

100 ms (10 ms)

Squelch Attack Time

150 ms (110 ms)

Squelch Closing Time

150 ms (20 ms)

Current Consumption

Squelched: 150mA (130mA)

AF 2W : 500mA (450mA)

(1 channel, without tone equipment, 13.2V supply)

TRANSMITTER

RF Power Output

CQM5110-6/10: 6 or 10W

CQM5110-25: 25W

RL = 50Ω

Crystal Frequency Range

48.6 - 58MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s}{3}$$

Frequency Stability

Conforms with government regulations

Undesired Radiation

max. 0.2uW

Sideband Noise Power, CEPT

less than 70db

AF Input Impedance

560 ohm

Modulation Sensitivity

70mV ± 2dB

(60% Δf max, 1kHz)

Modulation Response

300 - 3000 Hz

+1/-3.0dB (+0.5/-2dB)

relative to 1000Hz, 6dB/octave

400 - 2700Hz

+1/-1.5dB (+0.5/-1dB)

relative to 1000Hz, 6dB/octave

Modulation Distortion

fm = 1000Hz: max. 3%

Δf = ±3.0KHz

fm = 300Hz: max. 5%

Δf = ±0.9KHz

measured with 750 μ sec de-emphasis

FM Hum and Noise

70dB

CEPT (measured with 750 μsec de-emphasis)
and psophometric filter.

Current Consumption

6W: less than 3.5A (2.5A)

10W: less than 4.0A (3.0A)

25W: less than 6.0A (5.0A)

GENERAL DESCRIPTION

CQM5110

The Stornophone 5000 is a mobile radiotelephone unit with self-contained controls and loudspeaker.

Although compact in size, it contains a transmitter /receiver, optional 5-tone sequential encoder/decoder or Channel Guard, and up to 6 transmit and receive channels.

A comparison of the various models are presented in the table below.

Type	CQM5112		CQM5113		CQM5114	
SPEC	6/10	25	6/10	25	6/10	25
Frequency Range MHz	146 - 174		146 - 174		146 - 174	
RF Power W	6/10	25	6/10	25	6/10	25
Channel Spacing kHz	30/25		20		12, 5	
Max. Number of Channels	6		6		6	

ACCESSORIES

Standard accessories include:

- Mounting frame
- Power cable
- Fist microphone with retainer or
- Fixed - mount microphone
- External loudspeaker
- External switches

MC5001

Fist microphone with retractable spiral cable for mobile installation.

HS5001 Retainer for MC5001

HS5002 Retainer, with switches, for MC5001

MC704

Microphone with chockabsorbing mounting bracket for mobile installation.

MN5001

Mounting frame for mobile installations allowing the radio to be fixed in 36 positions. Includes a base plate with locking screw.

MC703

Desk microphone with PTT switch for fixed installations.

MN703

Desk stand for fixed installations.

MK5001

Installation kit containing connectors, power cable, fuses and fuseholders.

MN704a

Mounting frame for mobile installations and direct attachment to the vehicle.

LS701

Loudspeaker enclosed in a plastic housing, complete with cable.

SU701

Transmitter keying switch for mounting on the steering column.

SU702

Transmitter keying switch for mounting on the dashboard.

PS702

Power supply regulator for 24V car battery installations.

PS5001

Power supply for 220V AC mains.

MECHANICAL AND ELECTRICAL DESCRIPTION

The internal construction of CQM5000 is on an H-frame chassis with a shelf separating the receiver/transmitter (RF) printed circuit board and the various option printed boards. Front panel controls are an integral part of the printed board assemblies.

The chassis is a die cast aluminium frame comprising the left and right sides, the back, and a shelf located midway between the top and bottom. The chassis front is open and looks like an "H" viewed from the front.

Interconnection to the package exterior and to internal options are made via a System Interconnect Board located on the option side of the H-frame. A test connector is also located on the system board and is accessible from the rear of the radio.

This board also serves as channel switch unit in sets with multichannel option.

The moulded plastic front is directly attached to the chassis and has the speaker mounted to it. A separate moulded speaker grill and aluminum nameplate are attached to the front.

The top and bottom covers slides under the edge of the front and are then secured by screws at the rear.

The tone signalling encoder/decoder board (TQ) and the multifrequency board (XS) mount in the top section of the chassis. Their switches and pushbutton mount directly on the boards and protrude through the front.

Thin casted shields with adjustment holes are placed over the transmitter and receiver oscillators and parts of the transmitter in order to reduce spurious radiation.

CIRCUIT DESCRIPTION

Receiver

The receiver circuitry is placed on the main board and can be divided into:

- Receiver front end
- 1st IF section with first and second oscillator 455kHz
- 2nd IF portion with demodulator.

(refer to functional block diagram)

Front-End

The receiver front-end consists of a dual-resonator input filter, a transistor RF amplifier, Q401, a triple-resonator intermediate filter and a FET mixer, Q402. The drain of the FET is terminated in the first IF resonant circuit which adapts the output impedance to the crystal filter. The front-end, antenna relay, first

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Channel Spacing kHz	30/25		20		12, 5	
Max. Number of Channels	6		6		6	

ACCESSORIES

STANDARD ACCESSORIES

Mounting frame

Power cable

Fist microphone with retainer or

Fixed - mount microphone

External loudspeaker

External switches

LS701 Loudspeaker enclosed in a plastic housing, complete with cable.

MC702b Dynamic fist microphone with adjustable output level.

JB701a Junction box for MC702b. Consists of a plastic housing provided with cable for soldering assembly. Junction box is to mounted behind the first microphone retainer.

MC703a Desk microphone with PTT (Push -to - Talk) switch for fixed installations.

MC704 Microphone with chockabsorbing mounting bracket for mobile installation.

MK704 Mounting kit consisting of 2 flexible tubes, used for mounting the MC704 in close-talk position.

MC5001

Fist microphone with retractables piral cable for mobile installation.

HS5001

Retainer for MC5001

HS5002

Retainer, with switches, for MC5001

MC5002

Cylindrical handmicrophone with build-in amplifier and press-to talk switch. Fitted with a coiled cord terminated into a connector which fits into the microphone retainer.

HS5003

Retainer for MC5002, without hook switch.

HS5004

Retainer for MC5002, with hook switch.

MK5001

Installation kit containing connectors, power cable, fuses and fuseholders.

MN703

Desk stand for fixed installations.

MN704

Mounting bracket for the radio cabinet.

MN5001

Mounting frame for mobile installations allowing the radio to be fixed in 36 positions. Includes a base plate with locking screw.

MN5002

Mounting cassette for the radio cabinet (see mechanical layout).

MT5001

Microphone with retainer. The retainer contains a microswitch which is

used to switch off the internal loud-speaker, when the microphone is lifted.

- SU701 Transmitter keying switch for mounting on the steering column.
- SU702 Transmitter keying switch for mounting on the dashboard.
- SU704 Switch circuit for autoradio mounting.
- SU5003 External alarm with timer (Horn Alarm).

POWER SUPPLY UNITS:

Equipment	SUPPLY 220V AC	VOLTAGE +24V DC
CQM5000, max. 5 W	PS703	PS704
CQM5000, max. 20 W	PS5001	PS702

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- 1st IF section with first and second oscillator
- 455kHz 2nd IF portion with demodulator.

(refer to functional block diagram)

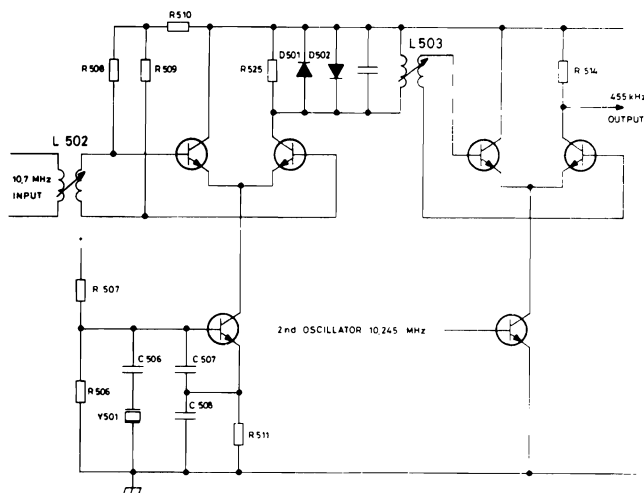
Front-End

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mixer and part of the transmitter PA inter-connections are design in micro-stripline techniques on the mainboard.

1st IF

The first IF frequency is 10.7MHz. The output from the crystal filter is fed to a dual-gate MOSFET amplifier, Q501, the output signal of which is fed to the second mixer, U501, a single balanced, self-oscillating, active mixer. Out of the second mixer comes the 455kHz IF signal. Two diodes, D501-502, limit the output from the mixer.



455kHz IF/Demodulator

The selectivity of the 455kHz IF amplifier is formed by a ceramic filter fed from a 455kHz amplifier/impedance transforming stage. The final 455kHz amplification and limiting is performed by an integrated circuit, U502, which also contains the quadrature FM detector and the AF amplifier/output emitter follower for the audio line signal.

SQUELCH AND AUDIO CIRCUITS

Squelch

The audio line signal (Vol/Sq - HI) is fed to a selective amplifier stage, where noise (frequencies around 8kHz) is extracted from the audio signal. Via the squelch potentiometer R607, this signal reaches an expander stage which improves the level discrimination characteristics of the circuit. A passive voltage doubler circuit (D603-D604) with high

source impedance performs the action of an average value rectifier. A Schmitt Trigger gives the necessary hysteresis and a well-defined output from the following buffer stage, Q605.

In the squelched condition and during transmissions this output is +1.5V and mutes the audio power amplifier.

The transmit indicator is part of the muting function.

A push button switch, S601, cancels the squelch function, when depressed, by grounding the base of Q601.

AUDIO

In sets with Pilot tone option, the audio line signal is fed to the Pilot tone board for filtering and back to the main board. In sets without CG this path is bypassed and the audio line signal is fed directly to the passive deemphasis network R629-C608 followed by the volume control. The volume control potentiometer R630 is mounted directly on the RF board and protrude through the front panel. The audio output amplifier U601 is a monolithic IC package capable of driving the loudspeaker at the desired power level. The output amplifier can be muted with a DC signal from the audio mute gate, which combines different logic signals to decide whether the amplifier should be active or not.

These inputs are:

- Regulated TX Voltage
- Squelch cancel
- Squelch signal

In sets equipped with Pilot tone and/or 5-tone sequential option, an RX mute function is routed from the option board to make the extra mute conditions possible. The value of C610 in the feed back loop is chosen as the best compromise between battery ripple rejection and receiver squelch attack time.

The pilot lamp in the channel knob is supplied from A+, but controlled by the regulated 8.5 V via transistor Q968.

TRANSMITTER

The transmitter consists of a modulation processor, an exciter, and a power amplifier, all assembled on the main board along with the receiver.

The exciter contains an FM oscillator, an audio processor, all frequency multiplier functions, and includes those stages operating at low enough power levels to avoid heat sinks. The exciter output is at the carrier frequency when applied to the power amplifier. The power amplifier boosts the signal to the proper level, and includes a low pass filter for suppressing harmonics and a circuitry which permits adjustment of the operating power level. The PA low pass filter connects to the antenna relay via a stripline on the board.

Modulation processor

The signal from the microphone load R901 on the XS board is applied to amplifier U101b. The transmitter audio frequency response is shaped by the feedback network R104-R103-C104.

The modulation limiting is obtained in the feedback network formed by D101, D102, R105, R106 and R107. The maximum permissible frequency deviation is set by R116 in single channel sets. In multichannel sets the potentiometer is turned to maximum and the deviation adjusted individually; refer to XS5111 and XS5112.

Amplifier U101A is operated as an active lowpass splatter filter feeding the modulating input of the FM oscillator.

Exciter

The exciter takes the third harmonic of the crystal oscillator, filters it to reduce spurious signals and amplifies it. Four amplifier stages (Q201-2-3-4) and four filters (L204-5-8-9) are

used in a narrow band design which limits the maximum frequency spread of the transmitter.

The exciter has three test points (TP201-2-3) for measurements and alignment.

Power Amplifier

The PA is constructed on the main board and employs two broadband untuned amplifier stages Q205, Q206. Two amplifier configurations are available providing options of power levels of 10 watts or 25 watts. A power control circuit is included to sense the output RF level and keep it constant with variations in temperature and supply voltage. This circuit also limits the peak power to less than maximum, as specified by the authorities, while still maintaining the output as near maximum as possible. The output power level can be set with a potentiometer, R215, over at least a 3:1 range. The transmitter delivers rated power into a 50-ohm load. A load SWR of 1.4:1 will result in more than 90% of the power being radiated. The transmitter will operate into a load with up to 3:1 SWR.

The power adjustment is achieved by controlling the supply voltage of power amplifier Q205 via transistor Q207. This series transistor is biased by a voltage generated by the feedback network C255, D201, Q201, Q209, Q208.

OSCILLATORS

The oscillators are located on the main board for single frequency radio sets. All parts for the oscillators and compensation network are soldered to the board except the crystal which is a plug-in type.

A multifrequency board is required for more than one frequency channel. This board is available in two versions; one (XS5111) has space for accommodating two transmit and two receive channels; one (XS5112) has space for up to six channels and an option for selecting the channels by a 3-digit BCD signal and a binary converter, U901-U902. The BCD signal is applied to three pins in J911. Separate active circuitry is used for each oscillator and all have their outputs connected to two buffer amplifiers Q927-Q967. The buffers' outputs are fed to their resonant circuit on the main board by a plug-in connection (J301-J151). The required oscillator is selected by switching the emitter of the oscillator transistor to the negative DC supply. The compensation voltage and audio for the oscillators is obtained from the same circuit on the main board via J902.

The maximum transmitter frequency deviation for the system is set by adjusting potentiometers, one for each channel, individually on each channel.

The oscillator uses a Colpitt's configuration with a bipolar transistor as the active element. The frequency is controlled by a third mode crystal which is operated at one third of the output frequency. This output frequency is selected by a tuned circuit in the transistor collector circuit. To provide modulation and compensation capability, the crystal, a variable inductor, and a varicap (variable capacitance diode) are connected in series. The inductor provides adjustment of the frequency to set the oscillator to the channel frequency. The varicap permits electrical adjustment of the frequency. Compensation voltage is generated by a resistor - thermistor network and applied to the varicap. A resistor in parallel with the crystal prevents oscillations with the crystal removed from the circuit.

Transmitter Oscillator

In the transmitter the circuit is used with the following additions. First, an inductor is placed across the crystal to resonate C_0 thus minimizing the audio distortion in the modulated output. Second, the audio voltage is superimposed on the compensating bias voltage to give the required deviation.

Receiver Oscillator

In the receiver the oscillator circuit has a buffer amplifier connected between the collector of the oscillator transistor and the tuned circuit, to provide the required power level.

SUPPLY VOLTAGE DISTRIBUTION SYSTEM

The battery voltage (A + BATT) enters the radio via two pins of the rear system connector to the interconnect board. Both inputs are connected to reverse polarity protection diodes D901, D902. The ground lead comes through the same connector and is connected to chassis ground through a fusible printed wiring path which will open in case of the ground wire being accidentally connected to A +.

One battery input goes directly from the interconnect board via a feed-through capacitor and a connector P201 to the transmitter PA stages. The other input feeds through P903 to the main board for two functions. One branch for the audio amplifier passes through an RC-ripple filter R638 - C618 and one of the ON/OFF switch sections S602. The other section of the ON/OFF switch controls the VB + to the voltage regulator U602 consisting of a monolithic regulator. The regulator output is fixed at 8.5V by means of a factory adjusted resistor.

Regulated 8.5V is switched to either the receiver or the transmitter by the antenna relay. The antenna relay is also supplied by the 8.5V regulated.

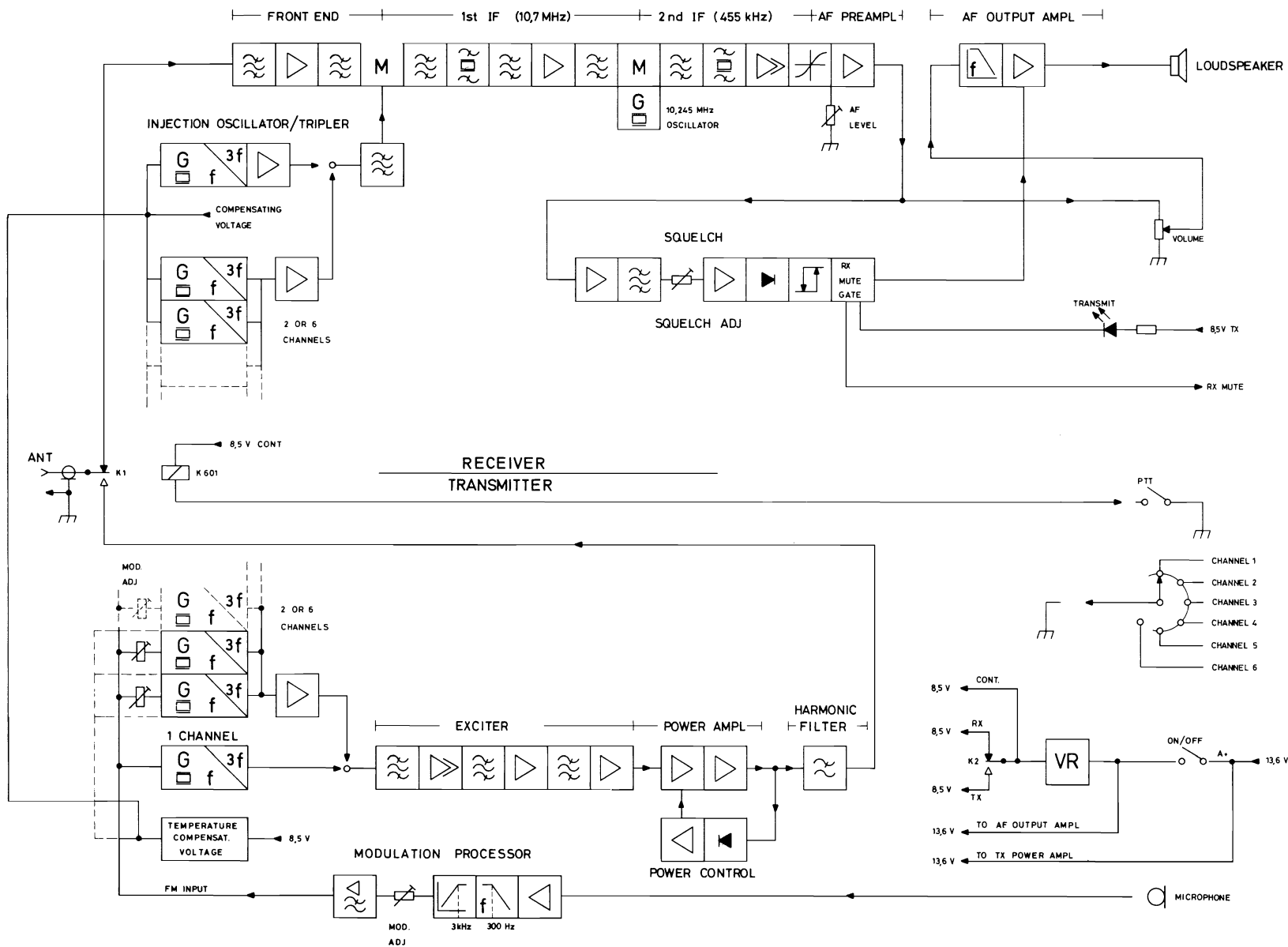
The squelch circuit, the modulation processor and parts of the IF amplifier U502 is supplied directly from the continuous 8.5 V.

The receiver front-end, the receiver oscillator, the 10.7 MHz IF stages and the second oscillator are supplied from 8.5V RX. The transmitter oscillator and the exciter are supplied from 8.5V TX.

In sets with 5-tone sequential option or Pilot tone, the PTT (Push to talk) lead runs through the option board to provide for correct tone keying function.

WARNING

The transmitter PA transistors contain Beryllia which is poisonous when absorbed by the human body. Dissection, filing, or grinding of these transistor may be hazardous.



FUNCTIONAL BLOCK DIAGRAM
CQM 5110

CQM5110 ADJUSTMENT PROCEDURE

General

This adjustment procedure applies to the following radiotelephone types:

CQM5112	30/25 kHz Channel spacing
CQM5113	20 kHz Channel spacing
CQM5114	12.5 kHz Channel spacing

Before making adjustments to the radiotelephone transmitter/receiver, read the type label and note the channel frequencies. Check all straps according to the notes on the diagrams. Also check the selective calling tone equipment, if any, against the coding instructions; refer to description of tone equipment. All screens must be in place and properly secured during the adjustments.

Measuring Instruments

The following list contains instruments necessary for adjusting the radiotelephone and checking its performance characteristics:

DC Voltmeter	$R_{in} \geq 1\text{Mohm}$
AC Voltmeter	$Z_{in} > 1\text{Mohm} // 50\text{pF}$
Multimeter	$R_i \geq 20\text{Kohm/Volt}$
Distortion meter	e. g. Storno E11c
RF Watt meter	25 W/50 ohm/145-175MHz
RF generator	$Z_{out} = 50\text{ ohm};$ 145-175 MHz
10.7 MHz signal generator	e. g. Storno TS-G21B
Frequency counter with attenuator	$Z_{in} = 50\text{ohm};$ sensitivity 100mV af 175 MHz
RF diode probe	Storno 95.0089-00
RF coaxial probe	Storno 95.0179-00
DC power supply	10.8 V - 16.6 V; 6A
Oscilloscope	0 - 5 MHz min.

Miscellaneous

4 ohm/3W resistor	3 x Storno code 82.5026
22 uF/40 V electrolytic capacitor	Storno code 73.5107-00
Connector, 11-pin house	Storno code 41.5543-00
Connector, 8-pin house	Storno code 41.5542-00
Pins for connectors	Storno code 41.5551-00

RECEIVER ADJUSTMENT

Checking 8.5 V regulated supply

Turn the power supply ON and set the voltage to 13.2 V. Set the power supply current limiter to 1A.

Turn the radiotelephone ON by depressing the ON/OFF button. Note the light in the Channel selector, if any, is on.

Depress the Squelch button.

Set the volume control to minimum.

Connect the DC voltmeter to J 901 pin 3 and read the voltage.

Requirement: $8.5\text{ V} \pm 0.15\text{ V}$

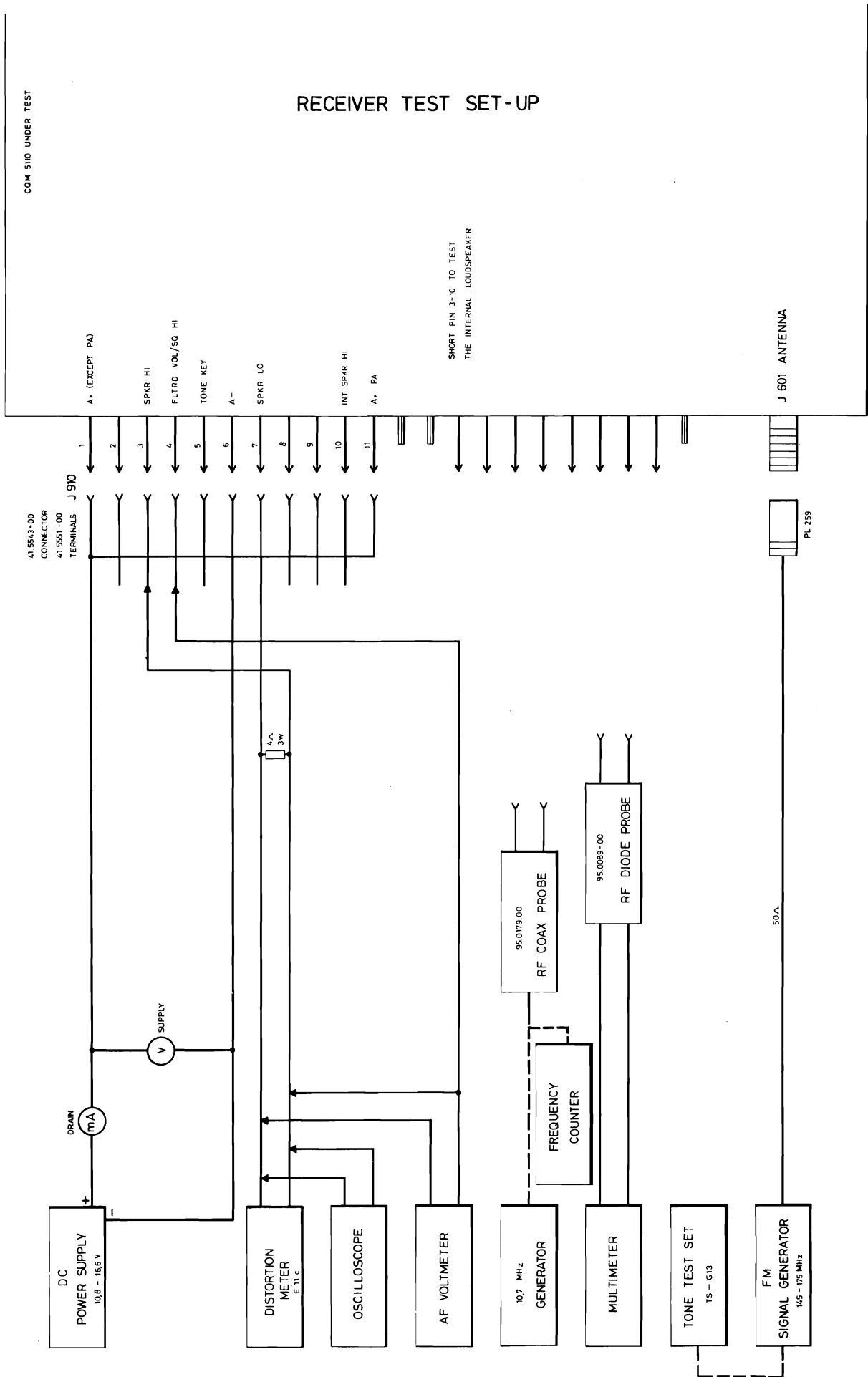
If the requirement is not fulfilled check resistor R636 against the colour code of U602.

U602 colour code	R636 Value
Brown	omit
Red	270
Orange	100
Yellow	47
Green	22
Blue	6.8

Adjust the power supply voltage to 16.6 V and read the 8.5 V regulated. Compare the change in the 8.5 volt regulated to the value obtained at 13.2 V.

Requirement: $\leq 50\text{ mV}$

Repeat the procedure with the power supply adjusted for 10.8 V



Oscillator(s) and Frequency Multiplier

In single channel sets the receiver oscillator is located on the RF5110 board. In multichannel sets all oscillators are on the XS5111 board (2 Channels) or XS5112 (6 Channels).

Select the channel whose frequency is closest to center frequency. If not otherwise indicated adjustments should be performed on that channel.

Connect RF diode probe 95.0089-00 leads to the multimeter and select the most sensitive voltage range.

Connect the probe to TP401 with the dot to the live terminal.

Single channel sets

Adjust L301 for maximum deflection

Multichannel sets

Adjust the following coils for maximum deflection:

L961,	Channel 1
L962,	Channel 2
L963,	Channel 3
L964,	Channel 4
L965,	Channel 5
L966,	Channel 6

Adjust L303 and L305 for maximum deflection;

Typical 2 to 3 volts

Requirement: ≥ 1 V

Receiver frequency adjustment

Connect coax probe 95.017900 to testpoint TP401.

Connect the frequency counter to the probe, and read the frequency. The frequency is measured after the tripler and shall be

$F_{\text{antenna}} = 10,7$ MHz

Single channel sets

Adjust L301 for the specified frequency ($3 \times f_x$)

This adjustment shall be performed at 25°C

Requirement: $F_{\text{nom}} \pm 0.4$ ppm (± 60 Hz at 150 MHz)

Multichannel sets

Adjust the following coils on the XS board to the specified receiver frequencies ($3 \times f_x$)

L961,	Channel 1
L962,	Channel 2
L963,	Channel 3
L964,	Channel 4
L965,	Channel 5
L966,	Channel 6

Requirement:

$F_{\text{nom}} \pm 0.4$ ppm (± 60 Hz at 150 MHz)

ppm = parts per million = $\times 10^{-6}$

IF Amplifiers

Connect a 10.7 MHz signal generator to TP401 via coax probe 95.017900.

Connect RF diode probe 95.008900 with multimeter to test point TP501. (50uA range).

During adjustment the RF generator output must be kept low enough to prevent limiting in the IF stages, i. e. a maximum reading of 50uA on the multimeter.

Adjust coils L503, L502, L501, and L406, in that order, for maximum deflection on the multimeter.

Front-end

Connect the RF probe 95.008900 and the multimeter to test point TP501. (50uA range).

Connect an unmodulated RF generator to the antenna connector, J601.

Set the generator frequency to the receiver frequency.

Adjust the generator output to produce a deflection on the multimeter, i. e. a maximum reading of 50uA on the multimeter.

Adjust L401 and L402 for maximum deflection.

Detune L403 and 405 as much as possible.

Adjust L404 for maximum deflection on the multimeter. This is the only adjustment of L404 and it must not be touched during the rest of the procedure.

Adjust L403 and L405 for maximum deflection on the multimeter.

Readjust L401 and L402 for maximum deflection.

Remove the RF diode probe.

IF demodulator

Standard Test condition:

Connect the RF generator to antenna connector and adjust the output to 1 mV e. m. f.

Modulate the RF generator with 1000 Hz to 60% of DF max.

CQM5112 = \pm 3 KHz

CQM5113 = \pm 2.4 KHz

CQM5114 = \pm 1.5 KHz

Connect a 4 ohm/3W resistor load to connector J910/37 (SPKR HI-SPKR LO).

Connect an AF voltmeter to J910/47 (FLTD VOL SPKR LO).

Turn R521 halfway up.

Adjust L504 for maximum reading on the AF voltmeter.

Connect a distortion meter and AF voltmeter and Distortion meter across the 4 ohm resistor (if Storno E11c distortion meter is used switch the function to AF voltmeter).

Adjust the volume control for approx. 2 V across the load.

Adjust L501 and L406 for minimum distortion.

The demodulated signal may be monitored on an oscilloscope connected in parallel with the distortion meter.

Connect the AF voltmeter and distortion meter to J910/47 (FLTD VOL - SPKR LO).

Adjust R521 for a reading of 275 mV on the AF voltmeter.

Requirement: 275 mV \pm 5 mV.

Read the distortion.

Typical Total Harmonic Distortion (THD) will be less than 5%.

Receiver Sensitivity, SINAD

EIA or CEPT method may be used.

Receiver sensitivity measurement EIA.

The SINAD sensitivity of a receiver is the minimum input signal that will provide at least 50% of the receiver's rated audio power with 12dB signal +noise +distortion to noise + distortion.

Method of measurement.CEPT

The purpose of the measurement is to define the ratio of one condition to another.

The first condition is the one where a modulated RF-signal drives the receiver into full limiting. The audio output is measured with the distortion meter (in the CAL position) and, disregarding the amplitude of the audio, this is adjusted to read 100% on the meter scale; this is our reference condition consisting of signal +noise +distortion, where 'signal' is the modulation of the RF, 'noise' is the lowest possible amount achieved from that particular receiver, when receiving a strong carrier, and 'distortion' is the modulation being slightly distorted in passing through the receiver.

The second condition is the one where the signal (modulation) is removed with a notch filter and the RF-signal is lowered in amplitude until the remaining noise and distortion increases to 20dB below the first condition, as read on the distortion meter scale, This corresponds to a reading of 10%, 10 being 20dB below 100, which was our reference condition.

In practice our first condition is achieved by feeding a minimum of 1000 uV of RF signal modulated with 1000 Hz at 2/3 Δ f max. to the receiver.

The audio output (which must be at least 100% of the receiver's audio rating) is measured through the psophometric filter, with the distortion meter in position CAL and adjusted with potentiometer ADJ. FSD. to a reading of 100.

The notch filter is then inserted in series with the audio by pressing one of the buttons marked in %. The meter needle immediately drops to indicate a low value, this being the receiver's inherent audio distortion.

By backing off the attenuator of the RF-generator thereby lowering the RF-input to the receiver, the noise will eventually increase; the attenuator is now adjusted for a 10% reading on the distortion meter scale.

At this stage it must be ensured that the increased noise and the signal (with the notch filter switched out while checking) still equals 100 on the meter scale.

The RF-generator's calibrated attenuator now shows the value of RF-signal required to achieve a 20dB ratio between signal + noise + distortion and noise + distortion, i. e. 20dB SINAD sensitivity.

EIA Method

The EIA method differs from CEPT by omitting the psophometric filter, adjusting the RF generator for $2/3 \times \Delta f_{max}$, and measure at 50% of the receiver's rated AF power. The SINAD sensitivity is measured as a 12dB ratio between signal + noise + distortion and noise + distortion, which corresponds to a reading of 25% noise + distortion.

Adjusting the sensitivity

Lower the RF generator output to obtain 20dB SINAD (10% THD as measured with the distortion meter). Readjust L402 for the best SINAD value, e. i. lowest generator output for 25% THD.

Measuring 20dB SINAD

Adjust the volume control for 2.45V as measured with an AF voltmeter across the load.

Adjust the RF generator output to obtain 20dB SINAD condition.

Read the 20dB SINAD sensitivity

Requirement: $\leq 0.75\mu V$ (e. m. f.)

The sensitivity should be measured on all channels, if more than one.

Measuring 12dB SINAD

Adjust the volume control for 2.45V as measured with an AF voltmeter across the load.

Adjust the RF generator to obtain 12dB SINAD condition.

Read the 12dB SINAD sensitivity.

Requirement: $\leq 0.3\mu V$ ($\frac{1}{2}$ e. m. f.)

The sensitivity should be measured on all channels, if more than one.

Audio Frequency Response

Set the signal generator to Standard Test Condition.

Adjust the volume control for 0.82V across the load. (40hm across SPKR HI - LO).

At 13.2V supply, $\Delta F = 60\% \Delta F_{max}$ and 1000Hz measure the output voltage according to the following table:

	Frequency	Level	Tol.
Type CQM5112	300Hz	+9dB	+1dB/-3dB
	1000Hz	0dB	
	3000Hz	-9.5dB	+1dB/-3dB
Type CQM5113	300Hz	+10.5dB	+1.5dB/-3dB
	400Hz	+8dB	+1.5dB/-1.5dB
	1000Hz	0dB	
	2700Hz	-8.6dB	+1.5dB/-1.5dB
	3000Hz	-9.5dB	+1.5dB/-3dB
	6000Hz	<-20dB	

AF Power Output

Adjust the RF signal generator to Standard Test Condition.

Set the supply voltage to 13.2V.

Adjust the volume control for 3W output (3.46V across the 4ohm load).

Measure the distortion (THD).

Requirement: THD \leq 5%.

Squelch

Release the squelch cancel button.

Adjust potentiometer R607 squelch adj. to open the receiver for an RF input signal corresponding to 8-10dB SINAD.

Current consumption

Measure the current consumption at 13.2V.

Requirements

Condition	1 channel	2 channels	6 channels
Standby	\leq 150mA	\leq 160mA	\leq 200mA
Receive	\leq 500mA	\leq 510mA	\leq 550mA
2W AF ~2,83V r. m. s. across 4ohm.			

For sets with selective calling facilities add current consumption of the tone unit to the figures above.

TRANSMITTER ADJUSTMENT

Adjust the power supply voltage to 13.2V and set current limiter as follows:

25W transmitter: 6A
10W transmitter: 4A

Refer to Receiver Alignment for measuring 8.5V regulated supply.

Preset all transmitter tuning slugs, L151, L204, L205, L208, and L209, to be flush with the coil form top.

Connect a multimeter (2.5 volt range) to test point TP201.

Turn the power control potentiometer, R215, to minimum, anticlockwise (CCW).

Connect a Wattmeter, (25W) to the antenna connector, J601.

Oscillator adjustment

In single channel sets the transmitter oscillator is located on the RF5110 board. In multichannel sets all oscillators are on the XS5111 board (2 channels) or XS5112 (6 channels).

Select the channel whose frequency is closest to the center frequency. If not otherwise

indicated adjustments should be performed on that channel.

Key the Transmitter.

Single channel sets

Adjust L153 for maximum deflection on the multimeter. The increase deflection is small and gently tuning is required. If the frequency is in the low end of the band it may be necessary to turn the slug of L151 (L921 - L926) partly into the coil form to obtain a multimeter deflection.

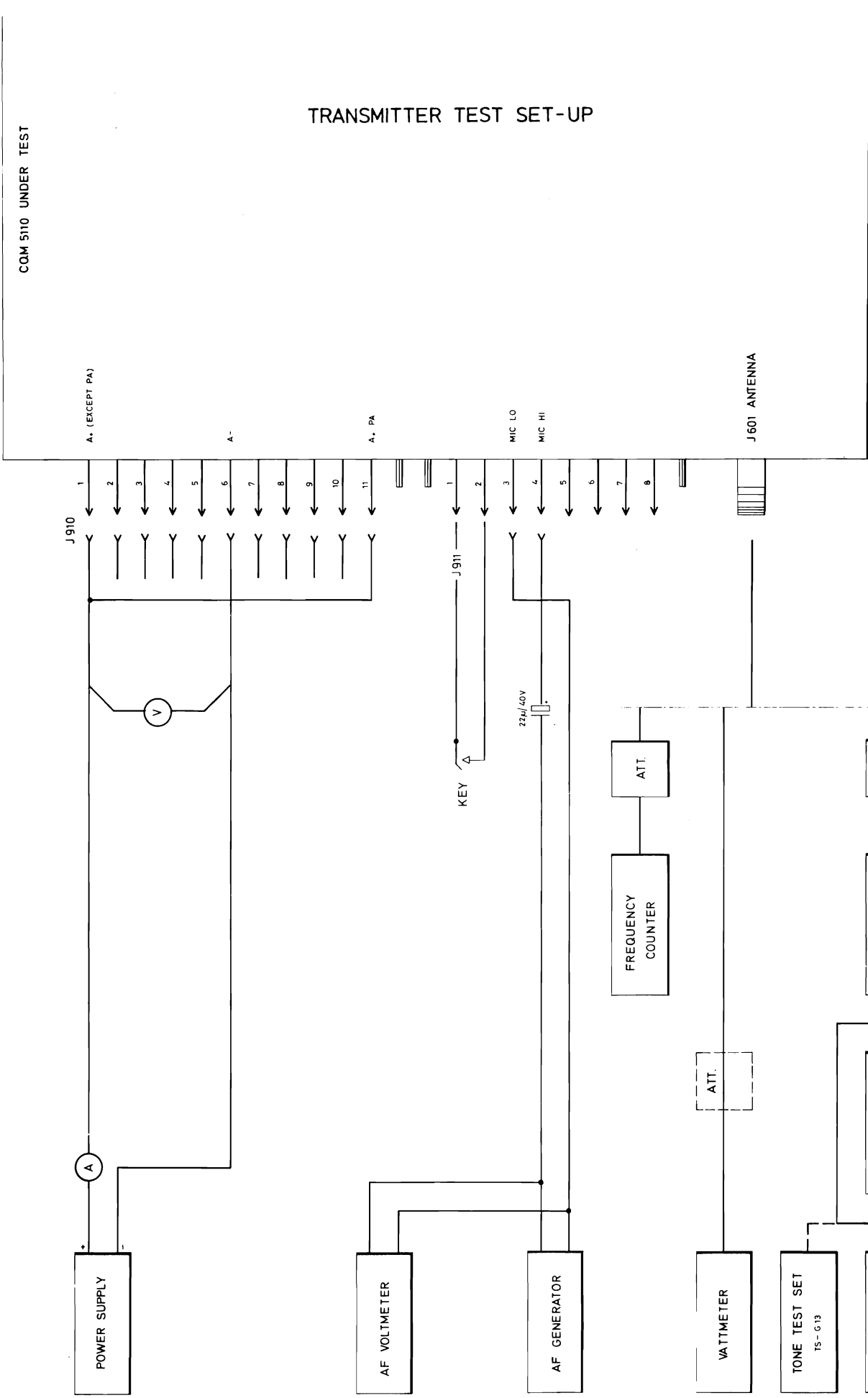
Adjust L151 for maximum meter reading, typical 1.2V.

Multichannel sets

Adjust the following coils for maximum deflection on the multimeter, typical 1.2V.

L921, channel 1
L922, channel 2
L923, channel 3
L924, channel 4
L925, channel 5
L926, channel 6

TRANSMITTER TEST SET-UP



Exciter, coarse adjustment

Connect a multimeter (2.5V range) to test point TP201. Adjust L153 for maximum deflection.

Adjust L204 for minimum deflection. The dip is small and careful tuning is required. Connect the multimeter (1V range) to test point TP202. Adjust L205 for maximum deflection on the multimeter, typical 0.4V.

Adjust L208 for minimum reading. The dip is small and careful tuning is required.

Connect diode probe 95.008900 and the multimeter to test point TP203.

Adjust L209 for maximum reading on the multimeter, typical 10V.

Adjust the PA power control, R215, for rated transmitter power, 6/10W or 25W.

Exciter, fine adjustment

Connect the multimeter to test point TP201.

Readjust L153 for maximum reading. Connect the multimeter to test point TP202. Peak L204 and L205 for maximum reading. If the maximum is not well defined detune L153 slightly, adjust L204 and L205, and repeat the adjustment of L153. Connect the 95.0089-00 RF probe and multimeter to test point TP203. Peak L208 and L209 for maximum reading.

Transmitter frequency adjustment

Connect a frequency counter through a suitable attenuator to the antenna connector J601.

Single channel sets

Adjust L151 to specified transmitter frequency.

Multichannel sets

Adjust the following coils on the XS board to the specified transmitter frequencies:

L921,	channel 1
L922,	channel 2
L923,	channel 3
L924,	channel 4
L925,	channel 5
L926,	channel 6

The frequency adjustment shall be performed at 25°C.

Requirement: $F_{nom} \pm 0.4 \text{ ppm}$.

RF power output, current consumption, and power control

Connect the Watt meter to the antenna connector, J601.

Increase the supply voltage to 16V. The voltage is measured directly at the input connector J910.

Readjust the PA power control, R215, for rated transmitter power (P), 6/10 or 25W.

Requirement: $P_{nom} \pm 0.1 \text{ dB}$.

Measure the RF power output at 16V, 13.2V and 10.8V.

Requirements (25W):

Voltage	Power	Current
16.6V	25W (ref)	$\leq 5.8 \text{ A}$
13.2V	$\geq 24 \text{ W}$	$\leq 5.8 \text{ A}$
10.8V	$\geq 20 \text{ W}$	$\leq 5.8 \text{ A}$

Requirements (10 W):

Voltage	Power	Current
16V	10W (ref)	$\leq 3.2 \text{ A}$
13.2V	$\geq 9 \text{ W}$	$\leq 3.2 \text{ A}$
10.8V	$\geq 8 \text{ W}$	$\leq 3.2 \text{ A}$

Requirements (6W):

Voltage	Power	Current
16V	6W (ref)	$\leq 2.6 \text{ A}$
13.2V	$\geq 5.5 \text{ W}$	$\leq 2.6 \text{ A}$
10.8V	$\geq 5.2 \text{ W}$	$\leq 2.6 \text{ A}$

MODULATION ADJUSTMENT

Set the power supply voltage to 13.2V.

Connect a deviation meter through an attenuator to the antenna connector, J601.

Connect a distortion meter and oscilloscope to the deviation meter output.

Connect an AF generator and an AF voltmeter to the microphone input via a 22 μ F capacitor; refer to test setup.

Adjust the AF generator output to 1V r. m. s. This voltage is approx. 20dB above the nominal modulation input level (60% Δf max) to ensure full limiting in the modulation processor.

Find the AF frequency between 200Hz and 3000Hz giving the greatest frequency deviation as read on the deviation meter with the transmitter keyed.

Check the maximum deviation for both positive and negative deviation polarity. At that audio frequency set the maximum frequency deviation Δf max with R116.

Type	Channel spacing	Δf max
CQM5112	30/25kHz	± 5 kHz
CQM5113	20kHz	± 4 kHz
CQM5114	12.5kHz	± 2.5 kHz

Requirement

Difference between + and - deviation: $\leq 10\%$

Multichannel sets

In multichannel sets R116 is turned 2/3 clockwise and the modulation adjustment is adjusted individually for each channel using the Δf max potentiometers on the XS board.

R956	= channel 1
R957	= channel 2
R958	= channel 3
R959	= channel 4
R960	= channel 5
R961	= channel 6

Modulation sensitivity and modulation distortion

Set the AF generator frequency to 1000Hz

Adjust the generator output until 60% of Δf max is obtained on the deviation meter.

CQM5112	: ± 3.0 kHz
CQM5113	: ± 2.4 kHz
CQM5114	: ± 1.5 kHz

Read the AF generator output and measure the modulation distortion on the audio output of the deviation meter.

Requirements:

Modulating signal: 75mV ± 2 dB

Distortion: $\leq 7\%$

(measured without deemphasis)

Modulation frequency response

Set the AF generator to 1000Hz.

Reduce the AF generator output until a deviation of $0.2 \times \Delta f$ max is obtained on the deviation meter.

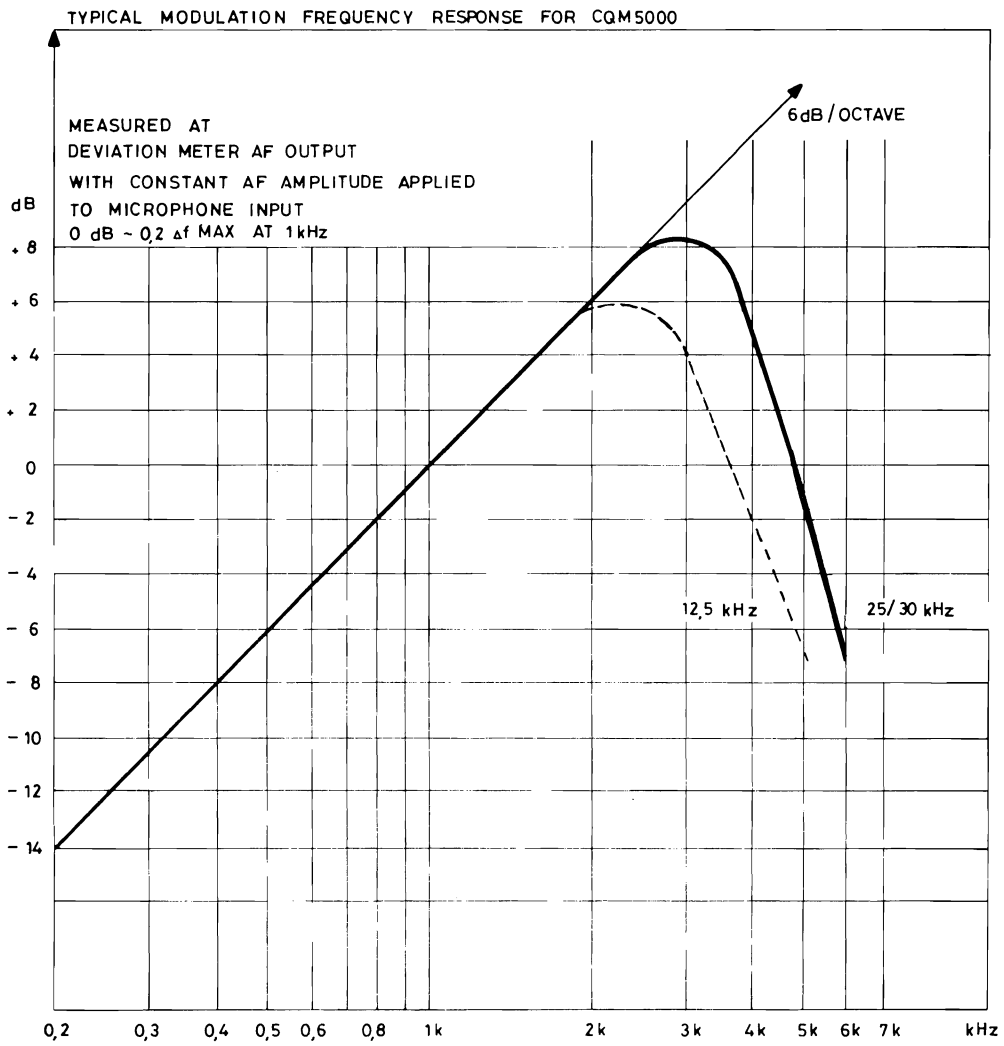
CQM5112	: ± 1.0 kHz
CQM5113	: ± 0.8 kHz
CQM5114	: ± 0.5 kHz

Vary the frequency of the generator and note the deviation changes as referred to the 1000Hz value.

Requirement :

Within the frequency range 400-2700Hz the frequency characteristic shall lie within +1dB/-1.5dB related to a 6dB/octave characteristic.

With 6kHz modulation frequency the deviation shall be attenuated at least 6dB below the 1kHz value.



ADJUSTMENT OF TONE EQUIPMENT

Measuring equipment

Tone Test Generator Storno TS-G13
 95B0251-00

Check the connections and the tone combination of the TQ5001/TQ5002 and SU/5002; refer to description and diagrams.

Adjustment of frequency deviation

Apply Standard test condition to the transmitter; refer to transmitter test setup.

Establish a shortcircuit between emitter and collector of Q108, on the solderside of the TQ unit, which will produce a continuous tone to the modulator.

Key the transmitter using the tone button.

Adjust R113, TQ5001/TQ5002 for 70% of maximum frequency deviation.

Remove the short circuit.

Connect the G13 Tone Test set to the AF output on the Deviation Meter.

Check that the tone call is properly received when the tone button is depressed.

Checking the Tone Receiver

Apply Standard test condition to the receiver; refer to receiver test setup.

Modulate the signal generator with the G13 Tone Test Set.

Set the G13 to the proper tone combination.

Check that the TQ5001/TQ5002 responds to a released tone call.

CQM 5000

APPENDIX A

ADJUSTMENT PROCEDURE

A function and test box for connecting the measuring instruments to the radiotelephone is convenient, and it will facilitate the adjustment procedure in workshops performing service to many CQM 5000 radiotelephones. A proposal and diagram for such a function and test box is shown below. The mechanical design is left to the user as it will depend on components available. This box can also switch the measuring instruments between various outputs, and can test the main functions of the radiotelephone.

The functions of the switches are:

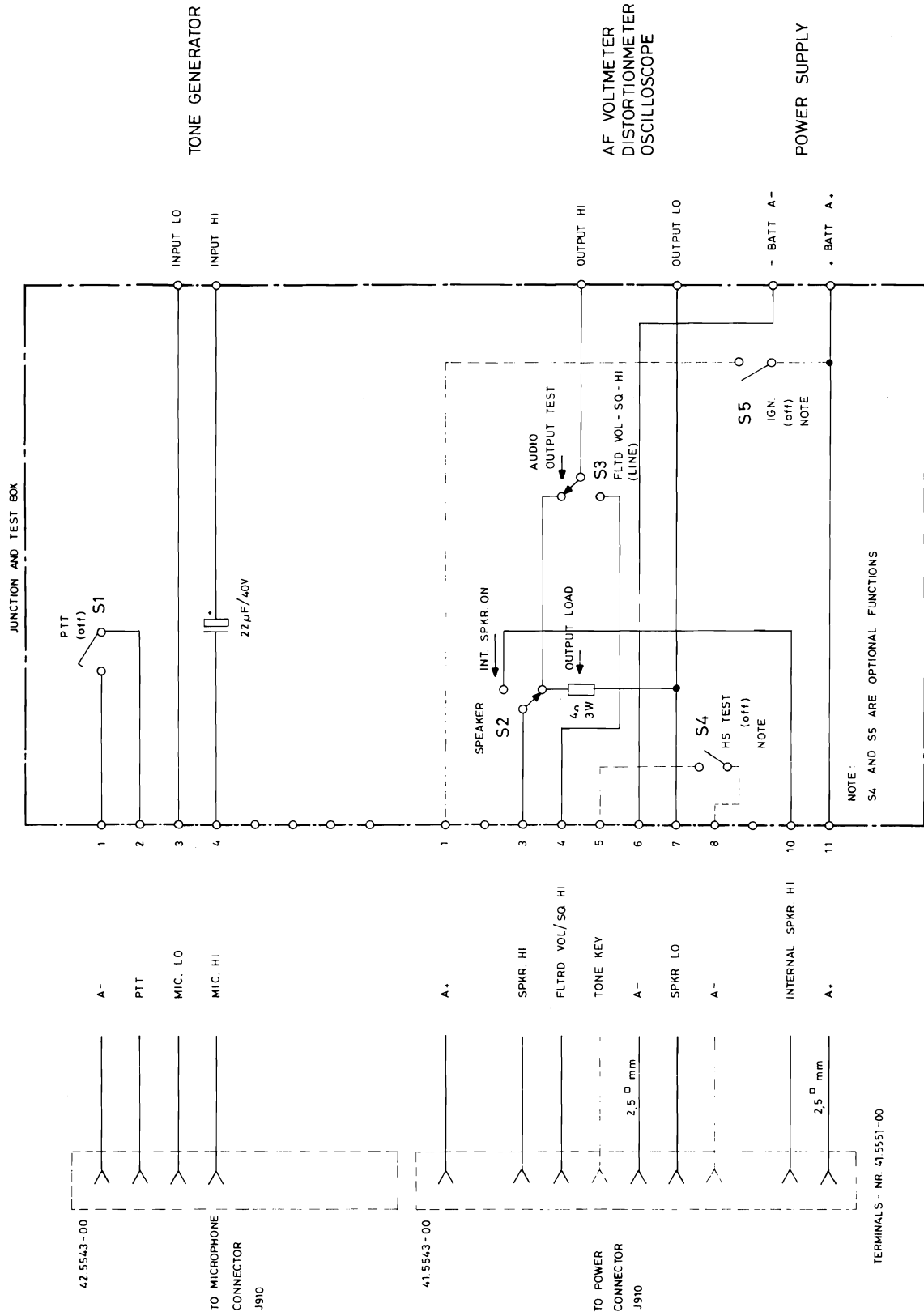
- S1. Push to Talk (PTT)
Keys the transmitter and a toggle or locking switch should preferably be used.
- S2. Resistor load Loudspeaker load
Loads the audio output amplifier with a 4 ohm resistor or tests the internal loudspeaker.
- S3. Audio output test FLTD VOL SQ HI test
Switches the AF voltmeter/distortion meter/oscilloscope between the audio output and the line level output (FLTD. VOLSQ. HI).

- S4. HS Test (Hook switch)
Simulates the function of a hook switch (tone key)
- S5. Ignition off.
Simulates the function of the ignition key switch. This switch is used to test the function of radio sets using the ignition switch as on/off.

Switches S4 and S5 are optional and may be omitted. If so, a connection between terminal 1 and terminal 2 must be established.

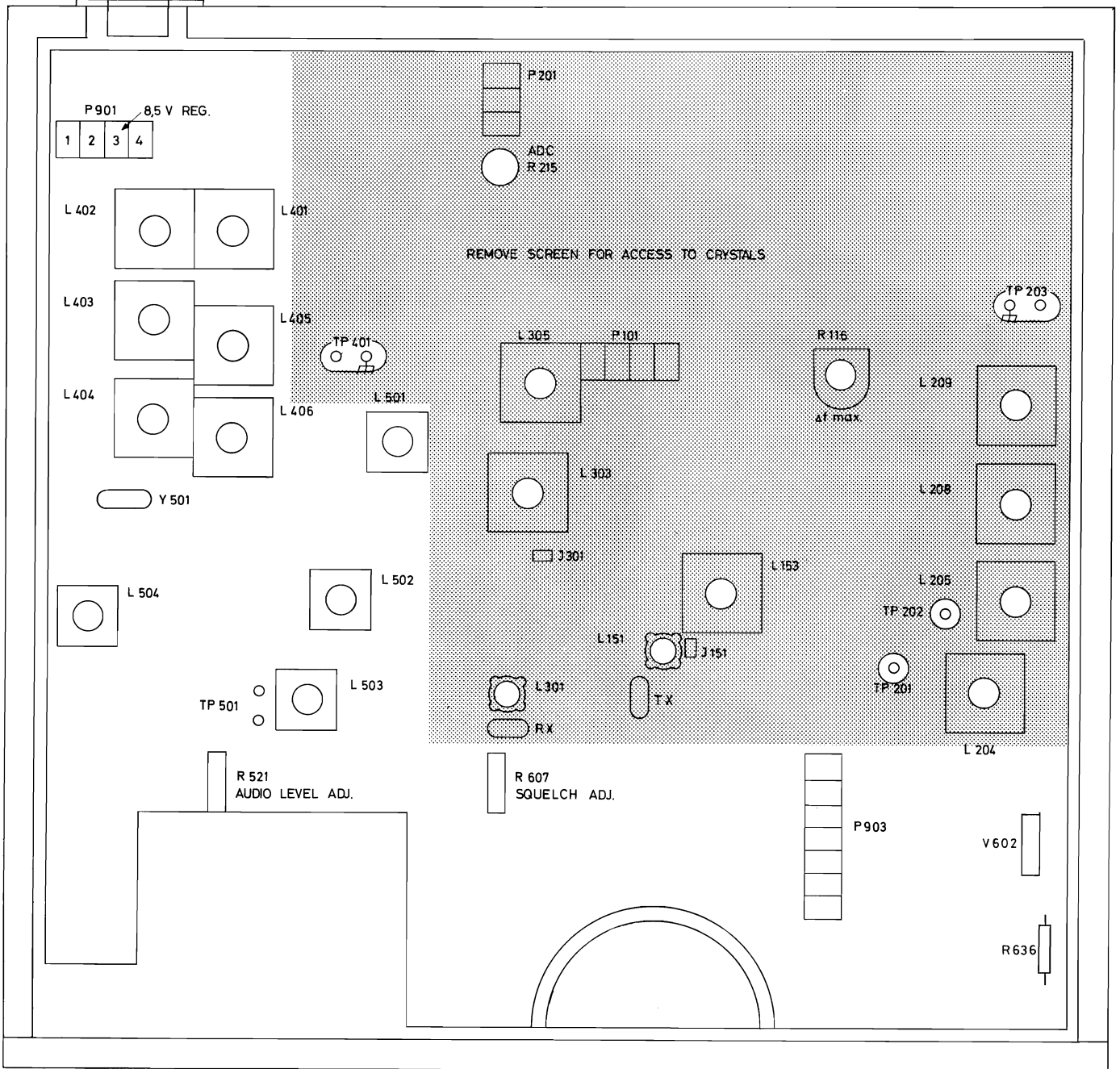
The box is via a cable terminated in two connectors fitting the rear sockets of a CQM 5000, and the instrument terminals should be types used for common test leads.

Note: All power supply wires must be at least 2.5. squaremillimetres.

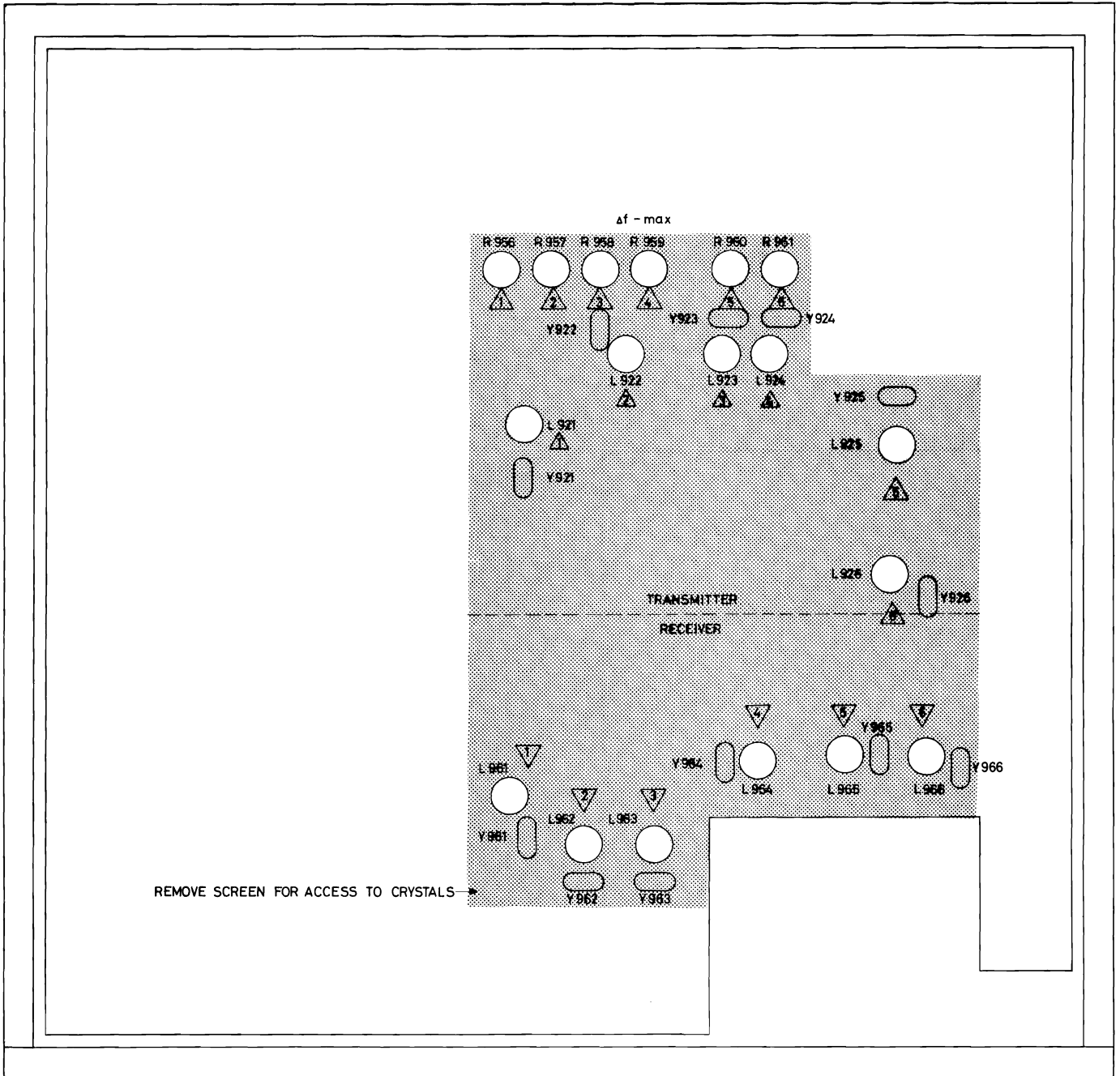


CQM 5000

TERMINALS - NR. 41 5551-00



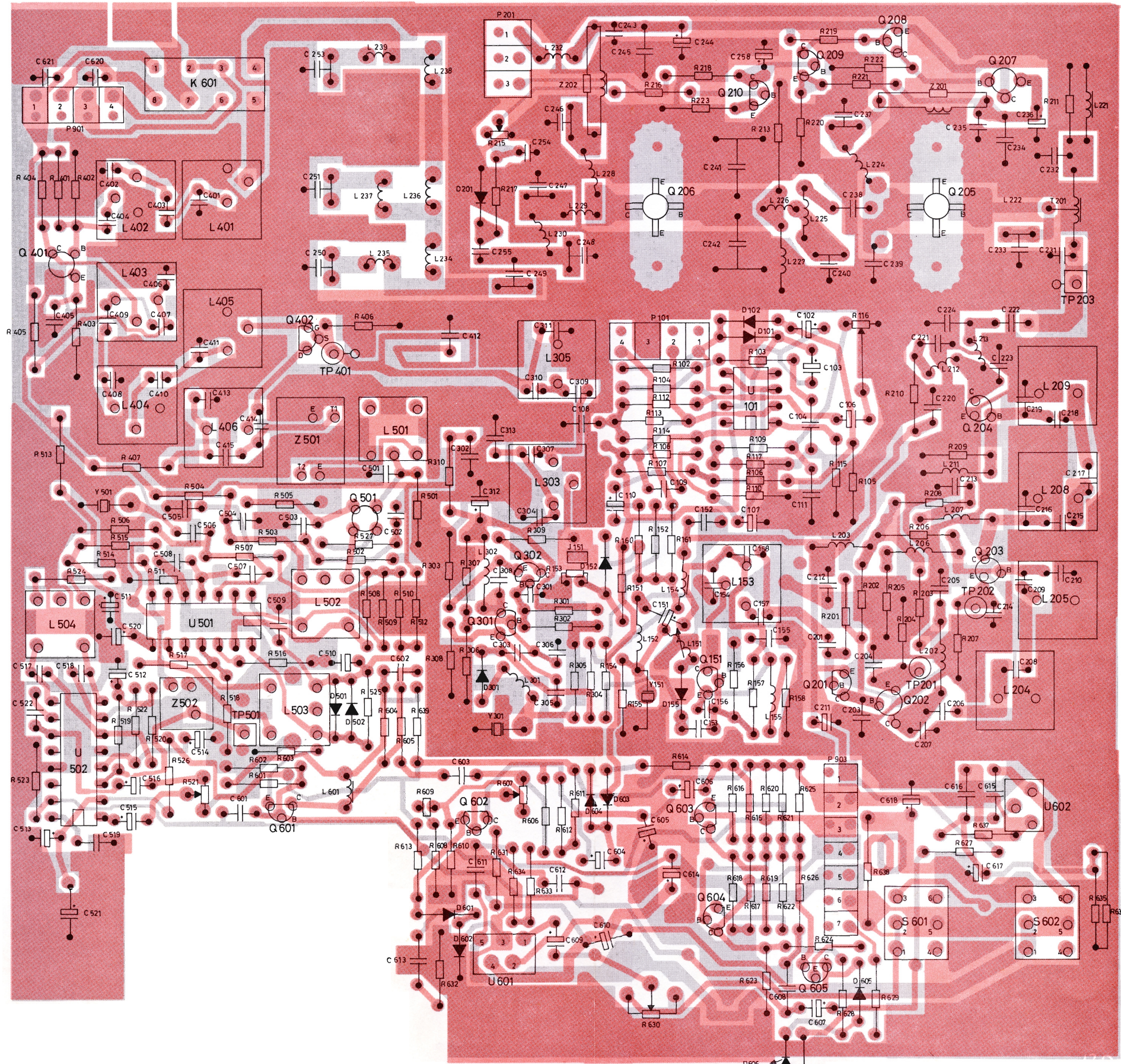
ADJUSTABLE COMPONENTS AND
TEST POINTS ON RF 5110

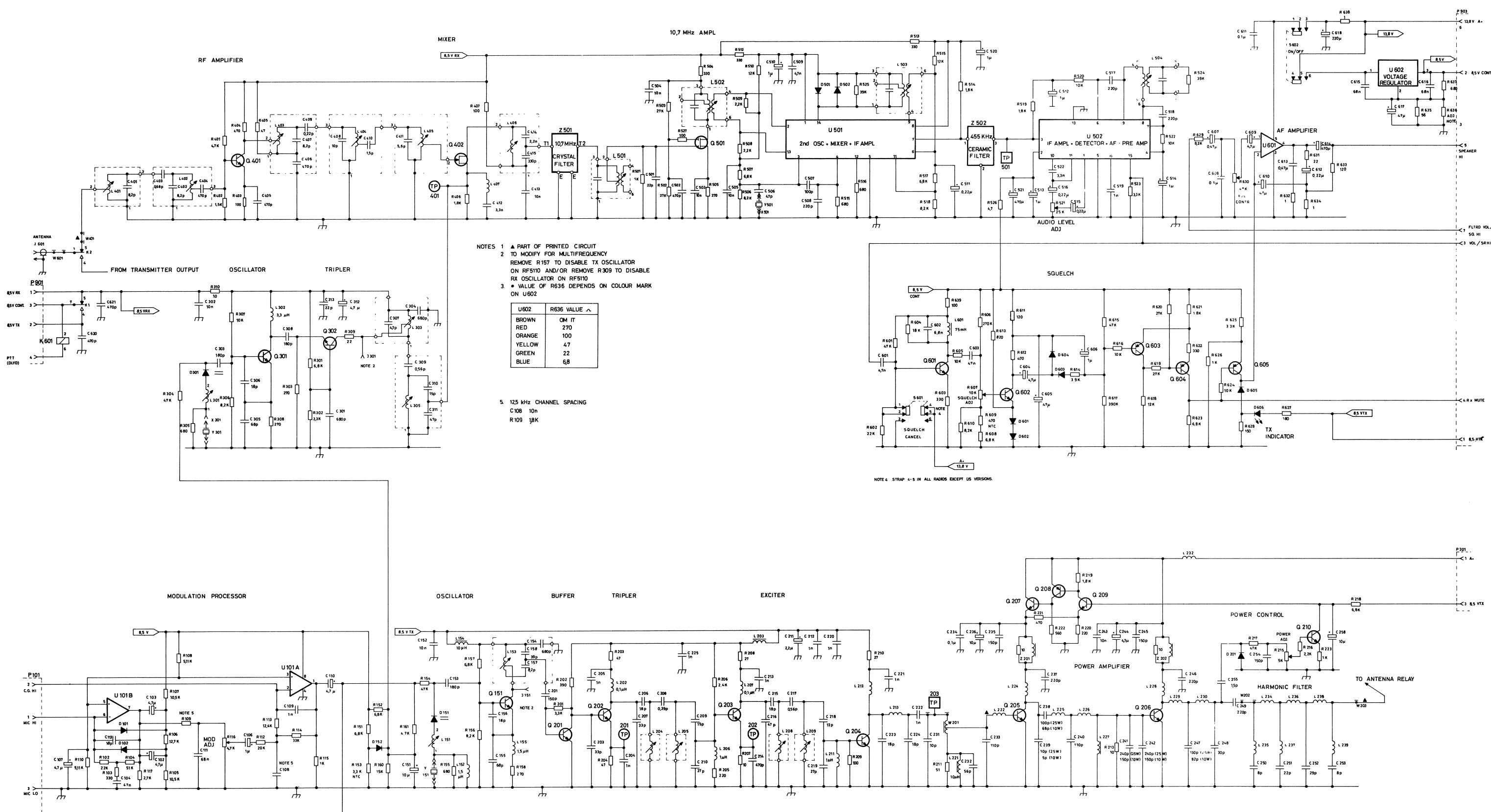


▽_x = RECEIVER CHANNEL

△_x = TRANSMITTER CHANNEL

ADJUSTABLE COMPONENTS AND TEST POINTS ON XS 5111 / XS 5112



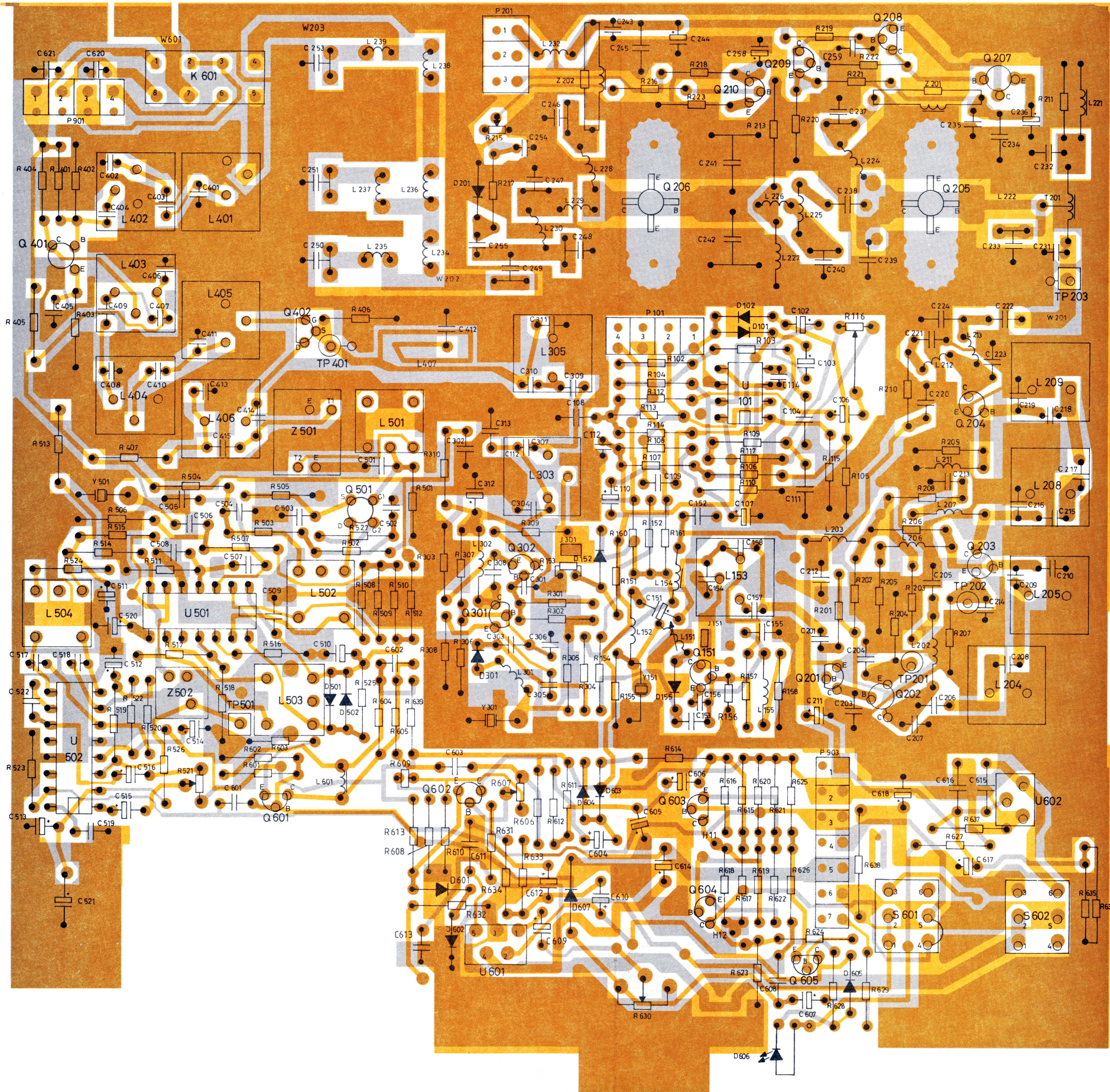


- NOTES
- ▲ PART OF PRINTED CIRCUIT
 - TO MODIFY FOR MULTIFREQUENCY REMOVE R157 TO DISABLE TX OSCILLATOR ON RF5110 AND/OR REMOVE R309 TO DISABLE RX OSCILLATOR ON RF5110
 - VALUE OF R636 DEPENDS ON COLOUR MARK ON U602

U602	R636 VALUE
BROWN	OM IT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6,8

5. 125 kHz CHANNEL SPACING
 C108 10n
 R109 18K

NOTE 4 STRAP 4-5 IN ALL RADIOS EXCEPT US VERSIONS



TYPE	Nº	CODE	DATA
	C102	73. 5172	Tantal
	C103	73. 5172	Tantal
	C104	76. 5142	Polyest FL
	C106	73. 5170	Tantal
	C107	73. 5172	Tantal
	C108	76. 5140	Polyest FL
	C109	74. 5397	Ceram DI
	C110	73. 5172	Tantal
	C111	76. 5151	Polyest FL
	C112	74. 5392	Ceram DI
	C151	73. 5173	Tantal
	C152	76. 5135	Polyest FL
	C153	74. 5386	Ceram DI
	C154	74. 5396	Ceram DI
	C155	74. 5405	Ceram DI
	C156	74. 5403	Ceram DI
	C157	74. 5371	Ceram DI
	C158	74. 5378	Ceram DI
	C201	74. 5371	Ceram DI
	C203	74. 5377	Ceram DI
	C204	74. 5397	Ceram DI
	C205	74. 5397	Ceram DI
	C206	74. 5374	Ceram DI
	C207	74. 5377	Ceram DI
	C208	79. 5003	Phenolic TB
	C209	74. 5373	Ceram DI
	C210	74. 5377	Ceram DI
	C211	73. 5171	Tantal
	C212	74. 5397	Ceram DI
	C213	74. 5397	Ceram DI
	C214	74. 5395	Ceram DI
	C215	74. 5374	Ceram DI
	C216	74. 5379	Ceram DI
	C217	79. 5005	Phenolic TB
	C218	74. 5372	Ceram DI
	C219	74. 5378	Ceram DI
	C220	74. 5397	Ceram DI
	C221	74. 5397	Ceram DI
	C222	74. 5397	Ceram DI
	C223	74. 5374	Ceram DI
	C224	74. 5374	Ceram DI
	C225	74. 5397	Ceram DI
	C231	74. 5371	Ceram DI
	C232	74. 5380	Ceram DI
	C233	75. 5026	Mica
	C234	76. 5144	Polyest FL
	C235	74. 5392	Ceram DI

TYPE	Nº	CODE	DATA
	C236	73. 5173	Tantal
10W	C237	75. 5028	Mica
25W	C238	74. 5030	Mica
10W	C239	75. 5020	Mica
25W	C239	75. 5029	Mica
	C240	75. 5019	Mica
10W	C241	75. 5026	Mica
25W	C241	75. 5022	Mica
10W	C242	75. 5031	Mica
25W	C242	75. 5022	Mica
	C243	76. 5144	Polyest FL
	C244	73. 5172	Tantal
	C245	74. 5392	Ceram DI
	C246	75. 5028	Mica
25 W	C247	75. 5027	Mica
10W	C247	75. 5032	Mica
	C248	75. 5025	Teflon
	C249	75. 5028	Mica
	C250	75. 5023	Teflon
	C251	75. 5024	Teflon
	C252	75. 5021	Teflon
	C253	75. 5023	Teflon
	C254	74. 5392	Ceram DI
	C255	74. 5361	Ceram DI
	C258	73. 5173	Tantal
	C301	74. 5396	Ceram DI
	C302	76. 5135	Polyest FL
	C303	74. 5386	Ceram DI
	C304	74. 5396	Ceram DI
	C305	74. 5405	Ceram DI
	C306	74. 5403	Ceram DI
	C307	74. 5369	Ceram DI
	C308	74. 5386	Ceram DI
	C309	79. 5005	Phenolic TB
	C310	74. 5373	Ceram DI
	C311	74. 5379	Ceram DI
	C312	73. 5172	Tantal
	C313	74. 5375	Ceram DI
	C401	74. 5370	Ceram DI
	C402	74. 5370	Ceram DI
	C403	79. 5006	Phenolic TB

RF UNIT RF5110

X402. 653

TYPE	NO	CODE	DATA
25 W	L225	62.0985	146-174 MHz
10 W	L225	62.0988	RF coil
	L226	62.0979	RF coil
	L227	61.1383	RF choke
25 W	L228	62.0986	146-174 MHz
10 W	L229	62.0979	RF coil
25 W	L229	62.0983	RF coil
10 W	L230	62.0984	RF coil
	L230	62.0986	RF coil
	L232	62.0981	RF coil
	L234	62.0981	RF coil
	L235	62.0980	RF coil
	L236	62.0981	RF coil
	L237	62.0979	RF coil
	L238	62.0981	RF coil
	L239	62.0980	RF coil
	L301	61.5034	45-55 MHz
	L302	61.5015	3.3 uH 10%
	L303	61.5041	146-174 MHz
	L305	61.5035	135-164 MHz
	L401	61.5037	146-174 MHz
	L402	61.5037	146-174 MHz
	L403	61.5037	146-174 MHz
	L404	61.5037	146-174 MHz
	L405	61.5039	146-174 MHz
	L406	61.5038	10.7 MHz
	L501	61.5026	10.7 MHz
	L502	61.5026	10.7 MHz
	L503	61.5025	455 kHz
	L504	61.5025	455 kHz
	L601	61.5023	75 uH 10%
	P101	41.5541	IF transformer
	P201	41.5545	IF transformer
	P901	41.5541	IF transformer
	P903	41.0230	IF transformer
	Q151	99.5347	RF choke
	Q201	99.5363	Fem. connector
	Q202	99.5348	Fem. connector
	Q203	99.5348	Fem. connector
	Q204	99.5349	Fem. connector
	Q205	99.5342	Fem. connector
	Q206	99.5343	Fem. connector
25 W	Q206	99.5344	Transistor
10 W	Q207	99.5345	Transistor
	Q208	99.5251	Transistor
	Q209	99.5121	Transistor
	Q210	99.5121	Transistor
	Q301	99.5347	Transistor

TYPE	NO	CODE	DATA
	Q302	99.5347	PN2369
	Q401	99.5240	Transistor
	Q402	99.5245	Transistor
	Q501	99.5291	J-FET
	Q601	99.5143	Mos-FET
	Q602	99.5201	Transistor
	Q603	99.5115	Transistor
	Q604	99.5115	Transistor
	Q605	99.5115	Transistor
	R102	80.5265	Carbon film
	R103	80.5243	Carbon film
	R104	89.5095	Carbon film
	R105	89.5083	Carbon film
	R106	89.5085	Metal film
	R107	89.5083	Metal film
	R108	89.5082	Metal film
	R109	89.5091	Metal film
	R110	89.5082	Metal film
	R112	89.5086	Metal film
	R113	89.5084	Metal film
	R114	89.5087	Metal Film
	R115	80.5249	Carbon film
	R116	86.5050	Carbon pot.
	R117	80.5254	Carbon film
	R151	80.5259	Carbon film
	R152	80.5259	Carbon film
	R153	89.5088	Carbon film
	R154	80.5269	NTC
	R155	80.5247	Carbon film
	R156	80.5260	Carbon film
	R157	80.5261	Carbon film
	R158	80.5242	Carbon film
	R160	80.5263	Carbon film
	R161	80.5257	Carbon film
	R201	80.5255	Carbon film
	R202	80.5244	Carbon film
	R203	80.5233	Carbon film
	R204	80.5229	Carbon film
	R205	80.5241	Carbon film
	R206	89.5092	Carbon film
	R207	80.5225	Carbon film
	R208	80.5230	Carbon film

RF UNIT RF5110

X402.653

Storno

Storno

TYPE	Nº	CODE	DATA	TYPE	Nº	CODE	DATA
	R634	80.5213	1 ohm				Carbon film
	R635	80.5234	56 ohm				Carbon film
	R636	80.52XX	6.8-270 ohm				Carbon film
	R637	80.5247	680 ohm				Carbon film
	R638	80.5413	1 ohm				Carbon film
	R639	80.5237	100 ohm				Carbon film
	S601	47.0641					Switch
	T201	61.1385					RF transformer
	U101	14.5131	LM358				Dual OP amp.
	U501	14.5128	CA3054				IF amplifier
	U502	14.5129	TBA750				IF amp/detec.
	U601	14.5130	TDA2002				AF amplifier
	U602	14.0133					Voltage reg.
	Y501	98.5010	10.245 MHz				Crystal
	Z201	61.1384					Damping choke
	Z202	61.1384					Damping choke
5112	Z501	69.5037	10.7 MHz				Crystal filter
5113	Z501	69.5038	10.7 MHz				Crystal filter
5114	Z501	69.5039	10.7 MHz				Crystal filter
	Z502	69.5045	455 kHz				Ceram. filter
5114	Z502	69.5046	455 kHz				Ceram. filter

RF UNIT RF5110

X402.653

TYPE	NO	CODE	DATA
	C102	J701534P6	4.7 uF, 20%, Tantal
	C103	J701534P6	4.7 uF, 20%, Tantal
	C104	76.5142	47 nF, 5%, Polyester FL
	C106	J701534P4	1.0 uF, 20%, Tantal
	C107	J701534P6	4.7 uF, 20%, Tantal
	C108	76.5135	10nF, 10%, Polyester FL
	C108	76.5135	10 nF, 10%, Polyester FL
	C109	J700234P1	1 nF, 5%, Polyester FL
	C110	J701534P6	4.7 uF, 20%, Tantal
	C111	76.5151	68 nF, 5%, Polyester FL
	C112	74.5392	150 pF, 20%, Ceram DI
	C113	74.5374	18 pF, 5%, Ceram DI
	C114	74.5395	470 pF, 20%, Ceram DI
	C151	J700003P7	10 uF, 20%, Tantal
	C152	J700005P7	10 nF, 10%, Polyester FL
	C153	74.5386	180 pF, 5%, Ceram DI
	C154	74.5405	680 pF, 20%, Ceram DI
	C155	74.5403	68 pF, 5%, Ceram DI
	C156	74.5403	18 pF, 5%, Ceram DI
	C157	74.5370	8.2 pF, 0.25 pF, Ceram DI
	C158	74.5378	39 pF, 5%, Ceram DI
	C201	74.5392	150 pF, 20%, Ceram DI
	C203	74.5377	33 pF, 5%, Ceram DI
	C204	74.5397	1 nF, 20%, Ceram DI
	C205	74.5397	1 nF, 20%, Ceram DI
	C206	74.5374	18 pF, 5%, Ceram DI
	C207	74.5377	33 pF, 5%, Ceram DI
	C208	79.5003	0.39 pF, 5%, Phenolic TB
	C209	74.5373	15 pF, 5%, Ceram DI
	C210	74.5377	33 pF, 5%, Ceram DI
	C211	J701534P5	2.2 uF, 20%, Tantal
	C212	74.5397	1 nF, 20%, Ceram DI
	C213	74.5397	1 nF, 20%, Ceram DI
	C214	74.5395	470 pF, 20%, Ceram DI
	C215	74.5374	18 pF, 5%, Ceram DI
	C216	74.5379	47 pF, 5%, Ceram DI
	C217	79.5005	0.56 pF, 5%, Phenolic TB
	C218	74.5372	12 pF, 5%, Ceram DI
	C219	74.5378	39 pF, 5%, Ceram DI
	C220	74.5397	1 nF, 20%, Ceram DI
	C221	74.5397	1 nF, 20%, Ceram DI
	C222	74.5397	1 nF, 20%, Ceram DI

TYPE	NO	CODE	DATA
	C223	74.5374	18 pF, 5%, Ceram DI
	C224	74.5374	18 pF, 5%, Ceram DI
	C225	74.5397	1 nF, 20%, Ceram DI
	C231	74.5371	10 pF, 5%, Ceram DI
	C232	74.5380	56 pF, 5%, Ceram DI
	C233	75.5026	110 pF, 5%, Mica
	C234	76.5144	0.1 uF, 10%, Polyester FL
	C235	74.5392	150 pF, 20%, Ceram DI
	C236	J701534P7	10 uF, 20%, Tantal
10W	C237	75.5028	220 pF, 5%, Mica
25W	C238	75.5030	68 pF, 5%, Mica
	C238	75.5020	100 pF, 5%, Mica
	C239	75.5019	10 pF, 5%, Siliv, Mica
	C240	75.5026	110 pF, 5%, Mica
	C241	75.5031	150 pF, 5%, Mica
25W	C242	75.5022	240 pF, 5%, Mica
10W	C242	75.5031	150 pF, 5%, Mica
25W	C242	75.5022	240 pF, 5%, Mica
	C243	76.5144	0.1 uF, 10%, Polyester FL
	C244	J706339P4	4.7 uF, 20%, SAL ELECTR, CAP
	C245	74.5392	150 pF, 20%, Ceram DI
25 W	C246	75.5028	220 pF, 5%, Mica
10W	C247	75.5027	130 pF, 5%, Mica
	C247	75.5032	82 pF, 5%, Mica
	C248	75.5025	30 pF, 5%, Teflon
	C249	75.5028	220 pF, 5%, Mica
	C250	75.5023	8.0 pF, 0.5 pF, Teflon
	C251	75.5024	22 pF, 5%, Teflon
	C252	75.5021	29 pF, 2%, Teflon
	C253	75.5023	8.0 pF, 0.5 pF, Teflon
	C254	74.5392	150 pF, 20%, Ceram DI
	C255	74.5361	1.5 pF, 0.25 pF, Ceram DI
	C258	J701534P7	10 uF, 20%, Tantal
	C258	J700234P7	10nF, 10%, Tantal
	C301	74.5396	680 pF, 20%, Ceram DI
	C302	J700234P7	10 nF, 10%, Polyester FL
	C303	74.5386	180 pF, 5%, Ceram DI
	C304	74.5396	680 pF, 20%, Ceram DI
	C305	74.5405	68 pF, 5%, Ceram DI
	C306	74.5403	18 pF, 5%, Ceram DI
	C307	74.5369	6.8 pF, 0.25 pF, Ceram
	C308	74.5386	180 pF, 5%, Ceram DI

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TYPE	NO	CODE	DATA
	C309	79.5005	0.56 pF, 5%, Phenolic TB
	C310	74.5373	15 pF, 5%, Ceram DI
	C311	74.5379	47 pF, 5%, Ceram DI
	C312	J701534P6	4.7 uF, 20%, Tantal
	C313	74.5375	22 pF, 5%, Ceram DI
	C401	74.5370	8.2 pF, 0.25 pF, Ceram DI
	C402	74.5370	8.2 pF, 0.25 pF, Ceram DI
	C403	79.5006	0.68 pF, 5%, Phenolic TB
	C404	74.5395	470 pF, 20%, Ceram DI
	C405	74.5395	470 pF, 20%, Ceram DI
	C406	74.5395	470 pF, 20%, Ceram DI
	C407	74.5370	8.2 pF, 0.25 pF, Ceram DI
	C408	74.5370	8.2 pF, 0.25 pF, Ceram DI
	C409	79.5001	0.22 pF, 5%, Phenolic TB
	C410	74.5361	1.5 pF, 0.25 pF, Ceram DI
	C411	74.5368	5.6 pF, 0.25 pF, Ceram
	C412	J700234P4	3.3 nF, 10%, Polyester FL
	C413	J700234P7	10 nF, 10%, Polyester FL
	C414	J706280P1	2.2 nF, 10%, Ceramic 2DI
	C415	74.5389	330 pF, 5%, Ceram DI
	C501	74.5375	22 pF, 5%, Ceram DI
	C502	74.5395	470 pF, 20%, Ceram DI
	C503	J700005P7	10 nF, 10%, Polyester FL
	C504	J700005P7	10 nF, 10%, Polyester FL
	C505	J700005P7	10 nF, 10%, Polyester FL
	C506	74.5379	47 pF, 5%, Ceram DI
	C507	74.5383	100 pF, 5%, Ceramic DI
	C508	74.5387	220 pF, 5%, Ceram DI
	C509	J700234P5	4.7 nF, 10%, Polyester FL
	C510	J701534P4	1.0 uF, 20%, Tantal
	C511	73.5168	0.22 uF, 20%, Tantal
	C512	J701534P4	1.0 uF, 20%, Tantal
	C513	J701534P4	1.0 uF, 20%, Tantal
	C514	J700003P4	1.0 uF, 20%, Tantal
	C515	73.5168	0.22 uF, 20%, Tantal
	C516	73.5168	0.22 uF, 20%, Tantal
	C517	74.5393	220 pF, 20%, Ceram DI
	C518	74.5393	220 pF, 20%, Ceram DI
	C519	74.5397	1 nF, 20%, Ceram DI
	C520	J701534P4	1.0 uF, 20%, Tantal
	C521	73.5166	470 uF, -10+100%, Elco
	C522	J700234P4	3.3 nF, 10%, Polyester FL

TYPE	NO	CODE	DATA
	C601	J700234P5	4.7 nF, 10%, Polyester FL
	C602	J700234P6	6.8 nF, 10%, Polyester FL
	C603	J700234P11	47 nF, 10%, Polyester FL
	C604	J701534P6	4.7 uF, 20%, Tantal
	C605	73.5164	47 uF, -10+100%, Elco
	C606	J701534P4	1.0 uF, 20%, Tantal
	C607	73.5169	0.47 uF, 20%, Tantal
	C608	76.5144	0.1 uF, 10%, Polyester FL
	C609	J701534P6	4.7 uF, 20%, Tantal
	C610	J701534P9	47 uF, 20%, Tantal
	C611	76.5144	0.1 uF, 10%, Polyester FL
	C612	73.5168	0.22 uF, 20%, Tantal
	C613	76.5148	0.47 uF, 10%, Polyester FL
	C614	73.5166	470 uF, -10+100%, Elco
	C615	76.5143	68 nF, 10%, Polyester FL
	C616	76.5143	68 nF, 10%, Polyester FL
	C617	73.5164	47 uF, -10+100%, Elco
	C618	73.5165	220 uF, -10+100%, Elco
	C620	74.5395	470 pF, 20%, Ceram DI
	C621	74.5395	470 pF, 20%, Ceram DI
	D102	99.5374	1N458A, Diode, selected
	D101	99.5374	1N458A, Diode, selected
	D151	99.5341	Cap. Diode
	D152	99.5237	1N4148, Diode
	D201	99.5237	1N4148, Diode
	D301	99.5341	Cap. Diode
	D501	99.5237	1N4148, Diode
	D502	99.5237	1N4148, Diode
	D601	99.5237	1N4148, Diode
	D602	99.5237	1N4148, Diode
	D603	99.5237	1N4148, Diode
	D604	99.5237	1N4148, Diode
	D605	99.5237	1N4148, Diode
	D606	99.5303	1.6 V, LED
	D607	99.5237	1N4148, Diode
	J151	41.5529	Socket
	J301	41.5529	Socket
	J601	41.5165	UHF connector
	K601	58.5085	21-21, Relay
	L151	61.5032	48-58 MHz, RF coil
	L152	61.5030	1.5 uH, 10%, RF choke
	L153	61.5041	146-174 MHz, RF coil

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TYPE	Nº	CODE	DATA
	L154	61.5031	10 uH, 10%, RF choke
	L155	61.5030	1.5 uH, 10%, RF choke
	L202	61.5028	0.1 uH, 10%, RF choke
	L203	61.1383	RF choke
	L204	61.5036	146-174 MHz, RF coil
	L205	61.5036	146-174 MHz, RF coil
	L206	61.5029	1.0 uH, 10%, RF choke
	L207	61.5028	0.1 uH, 10%, RF choke
	L208	61.5036	146-174 MHz, RF coil
	L209	61.5036	146-174 MHz, RF coil
	L211	61.5029	1.0 uH, 10%, RF choke
	L212	62.0982	146-174 MHz, RF coil
	L213	62.0982	146-174 MHz, RF coil
	L221	61.5031	10 uH, 10%, RF choke
	L224	62.0987	146-174 MHz, RF coil
	L225	62.0985	146-174 MHz, RF coil
	L225	62.0988	146-174 MHz, RF coil
	L226	62.0979	146-174 MHz, RF coil
	L227	61.1383	RF choke
	L228	62.0986	146-174 MHz, RF coil
	L228	62.1030	AIR, RF coil
	L229	62.0979	146-174 MHz, RF coil
	L229	62.0983	146-174 MHz, RF coil
	L230	62.1031	146-174 MHz, RF coil
	L230	62.1031	146-174 MHz, RF coil
	L232	62.0981	146-174 MHz, RF coil
	L234	62.0981	146-174 MHz, RF coil
	L235	62.0980	146-174 MHz, RF coil
	L236	62.0981	146-174 MHz, RF coil
	L237	62.0979	146-174 MHz, RF coil
	L238	62.0981	146-174 MHz, RF coil
	L239	62.0980	146-174 MHz, RF coil
	L301	61.5034	45-55 MHz, RF coil
	L302	61.5015	3.3 uH, 10%, RF choke
	L303	61.5041	146-174 MHz, RF coil
	L305	61.5035	135-164 MHz, RF coil
	L401	61.5037	146-174 MHz, RF coil
	L402	61.5037	146-174 MHz, RF coil
	L403	61.5037	146-174 MHz, RF coil
	L404	61.5037	146-174 MHz, RF coil
	L405	61.5039	146-174 MHz, RF coil
	L406	61.5050	10.7-21.4 MHz, RF coil

TYPE	Nº	CODE	DATA
	L501	61.5026	10.7 MHz, IF transformer
	L502	61.5026	10.7 MHz, IF transformer
	L503	61.5025	455 kHz, IF transformer
	L504	61.5025	455 kHz, IF transformer
	L601	61.5023	75 uH, 10%, RF choke
	P101	41.5541	Fem. connector
	P201	41.5545	Fem. connector
	P901	41.5541	Fem. connector
	P903	41.0230	Fem. connector
	Q151	99.5347	PN2369, Transistor
	Q201	99.5363	2N3904, Transistor
	Q202	99.5348	Transistor
	Q203	99.5348	Transistor
	Q204	99.5349	RF transistor
	Q205	99.5342	PA Transistor
	Q206	99.5343	PA Transistor
	Q206	99.5344	PA Transistor
	Q207	99.5345	BD201, Transistor
	Q208	99.5251	BC307, Transistor
	Q209	99.5121	BC237, Transistor
	Q210	99.5121	BC237, Transistor
	Q301	99.5347	PN2369, Transistor
	Q302	99.5347	PN2369, Transistor
	Q401	99.5239	BFY90, Transistor
	Q402	99.5245	2N5245, J-FET
	Q501	99.5291	3N205, Mos-FET
	Q601	99.5143	BC238, Transistor
	Q602	99.5201	BC239, Transistor
	Q603	99.5115	BC309, Transistor
	Q604	99.5115	BC309, Transistor
	Q605	99.5115	BC309, Transistor
	R102	80.5265	22 Kohm, 5%, Carbon film
	R103	80.5243	330 ohm, 5%, Carbon film
	R104	89.5095	51 Kohm, 5%, Carbon film
	R105	89.5083	10.5Kohm, 1%, Metal film
	R106	89.5085	12.7Kohm, 1%, Metal film
	R107	89.5083	10.5 kohm, 1%, Metal film
	R108	89.5082	5.11 Kohm, 1%, Metal film
	R109	89.5091	1.3 Kohm, 5%, Carbon film
	R109	80.5252	1.8Kohm, 10%, Carbon film
	R109	80.5252	1.8 Kohm, 5%, Carbon film
	R110	89.5082	5.11 Kohm, 1%, Metal film

25 W
10 W

SME
RF5114

0.01 A
4 PIN
3 PIN
4 PIN
7 PIN

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TYPE	Nº	CODE	DATA
	R112	89.5086	20 Kohm, 1%, Metal film
	R113	89.5084	12.4 Kohm, 1%, Metal film
	R114	80.5267	33 Kohm, 1%, Metal Film
	R115	80.5253	2.2 Kohm, 5%, Carbon film
	R116	J708394P27	5 Kohm, 20%, Carbon pot.
	R117	80.5254	2.7 Kohm, 5%, Carbon film
	R151	80.5259	6.8 Kohm, 5%, Carbon film
	R152	80.5259	6.8 Kohm, 5%, Carbon film
	R153	89.5088	3.3 Kohm, 10%, RTC
	R154	80.5269	47 Kohm, 5%, Carbon film
	R155	80.5247	680 ohm, 5%, Carbon film
	R156	80.5258	5.6 Kohm, 5%, Carbon film
	R157	80.5259	6.8 Kohm, 5%, Carbon film
	R158	80.5242	270 ohm, 5%, Carbon film
	R160	80.5263	15 Kohm, 5%, Carbon film
	R161	80.5257	4.7 Kohm, 5%, Carbon film
	R201	80.5255	3.3 Kohm, 5%, Carbon film
	R202	80.5244	390 ohm, 5%, Carbon film
	R203	80.5233	47 ohm, 5%, Carbon film
	R204	80.5229	22 ohm, 5%, Carbon film
	R205	80.5241	220 ohm, 5%, Carbon film
	R206	89.5092	2.4 Kohm, 5%, Carbon film
	R207	80.5225	10 ohm, 5%, Carbon film
	R208	80.5230	27 ohm, 5%, Carbon film
	R209	80.5237	100 ohm, 5%, Carbon film
	R210	80.5230	27 ohm, 5%, Carbon film
	R211	89.5090	51 ohm, 5%, Carbon comp.
	R213	89.5089	10 ohm, 5%, Carbon comp.
	R215	86.5078	5 Kohm, 10%, Cerm. pot.
	R216	80.5253	2.2 Kohm, 5%, Carbon film
	R217	80.5257	4.7 Kohm, 5%, Carbon film
	R218	80.5259	6.8 Kohm, 5%, Carbon film
	R219	80.5252	1.8 Kohm, 5%, Carbon film
	R220	80.5241	220 ohm, 5%, Carbon film
	R221	80.5245	470 ohm, 5%, Carbon film
	R222	80.5246	560 ohm, 5%, Carbon film
	R223	80.5249	1 Kohm, 5%, Carbon film
	R224	89.5089	10 ohm, 5%, Carbon comp.
	R301	80.5259	6.8 Kohm, 5%, Carbon film
	R302	80.5255	3.3 Kohm, 5%, Carbon film
	R303	80.5242	270 ohm, 5%, Carbon film
	R304	80.5269	47 Kohm, 5%, Carbon film

TYPE	Nº	CODE	DATA
	R305	80.5247	680 ohm, 5%, Carbon film
	R306	80.5260	8.2 Kohm, 5%, Carbon film
	R307	80.5259	6.8 Kohm, 5%, Carbon film
	R308	80.5242	270 ohm, 5%, Carbon film
	R309	80.5229	22 ohm, 5%, Carbon film
	R310	80.5255	10 ohm, 5%, Carbon film
	R401	80.5257	4.7 Kohm, 5%, Carbon film
	R402	80.5251	1.5 Kohm, 5%, Carbon film
	R403	80.5237	100 ohm, 5%, Carbon film
	R404	80.5245	470 ohm, 5%, Carbon film
	R405	80.5233	47 ohm, 5%, Carbon film
	R406	80.5252	1.8 Kohm, 5%, Carbon film
	R407	80.5237	100 ohm, 5%, Carbon film
	R501	80.5249	1 Kohm, 5%, Carbon film
	R502	80.5266	27 Kohm, 5%, Carbon film
	R503	80.5266	27 Kohm, 5%, Carbon film
	R504	80.5243	330 ohm, 5%, Carbon film
	R505	80.5242	270 ohm, 5%, Carbon film
	R506	80.5260	8.2 Kohm, 5%, Carbon film
	R507	80.5259	6.8 Kohm, 5%, Carbon film
	R508	80.5253	2.2 Kohm, 5%, carbon film
	R509	80.5253	2.2 Kohm, 5%, Carbon film
	R510	80.5262	12 Kohm, 5%, Carbon film
	R511	80.5247	680 ohm, 5%, Carbon film
	R512	80.5243	330 ohm, 5%, Carbon film
	R513	80.5243	330 ohm, 5%, Carbon film
	R514	80.5252	1.8 Kohm, 5%, Carbon film
	R515	80.5262	12 Kohm, 5%, Carbon film
	R516	80.5247	680 ohm, 5%, Carbon film
	R517	80.5259	6.8 Kohm, 5%, Carbon film
	R518	80.5260	8.2 Kohm, 5%, Carbon film
	R519	80.5252	1.8 Kohm, 5%, Carbon film
	R520	80.5261	10 Kohm, 5%, Carbon film
	R521	J708394P9	25 Kohm, 20%, Carbon pot.
	R522	80.5261	10 Kohm, 5%, Carbon film
	R523	80.5255	3.3 Kohm, 5%, Carbon film
	R524	80.5268	39 Kohm, 5%, Carbon film
	R525	80.5268	39 Kohm, 5%, Carbon film
	R526	80.5221	4.7 ohm, 5%, Carbon film
	R527	80.5237	100 ohm, 5%, Carbon film
	R601	80.5269	47 Kohm, 5%, Carbon film
	R602	80.5265	22 Kohm, 5%, Carbon film

TYPE	NO	CODE	DATA
	R603	80.5243	330 ohm, 5%, Carbon film
	R604	80.5264	18 Kohm, 5%, Carbon film
	R605	80.5261	10 Kohm, 5%, Carbon film
	R606	80.5278	270 Kohm, 5%, Carbon film
	R607	J708394P8	10 Kohm, 20%, Carbon pot.
	R608	80.5259	6.8 Kohm, 5%, Carbon film
	R609	89.5053	470 ohm, 20%, NTC
	R610	80.5260	8.2 Kohm, 5%, Carbon film
	R611	80.5238	120 ohm, 5%, Carbon film
	R612	80.5245	470 ohm, 5%, Carbon film
	R613	80.5248	820 ohm, 5%, Carbon film
	R614	80.5256	3.9 Kohm, 5%, Carbon film
	R615	80.5269	47 Kohm, 5%, Carbon film
	R616	80.5261	10 Kohm, 5%, Carbon film
	R617	80.5280	390 Kohm, 5%, Carbon film
	R618	80.5262	12 Kohm, 5%, Carbon film
	R619	80.5266	27 Kohm, 5%, Carbon film
	R620	80.5266	27 Kohm, 5%, Carbon film
	R621	80.5252	1.8 Kohm, 5%, Carbon film
	R622	80.5243	330 ohm, 5%, Carbon film
	R623	80.5259	6.8 Kohm, 5%, Carbon film
	R624	80.5261	10 Kohm, 5%, Carbon film
	R625	89.5093	3 Kohm, 5%, Carbon film
	R626	80.5249	1 Kohm, 5%, Carbon film
	R627	80.5240	180 ohm, 5%, Carbon film
	R628	80.5239	150 ohm, 5%, Carbon film
	R629	80.5260	8.2 Kohm, 5%, Carbon film
	R630	86.5077	47 Kohm, 20%, Carbon pot.
	R631	80.5229	22 ohm, 5%, Carbon film
	R632	80.5213	1 ohm, 5%, Carbon film
	R633	80.5238	120 ohm, 5%, Carbon film
	R634	80.5213	1 ohm, 5%, Carbon film
	R635	80.5234	56 ohm, 5%, Carbon film
	R636	80.52XX	6.8-270 ohm, 5%, Carbon film
	R637	80.5247	680 ohm, 5%, Carbon film
	R638	80.5413	1 ohm, 5%, Carbon film
	R639	80.5237	100 ohm, 5%, Carbon film
	S601	B800563PI	Switch
	S602	B800563PI	Switch
	T201	61.1385	RF transformer
	U101	14.5141	4558, Dual OP amp.
	U501	14.5128	CA3054, IF amplifier

TYPE	NO	CODE	DATA
	U502	14.5129	TBA750, IF amp/detec.
	U601	14.5130	TDA2002, AF amplifier
	U602	14.0133	Voltage reg.
	Y501	98.5010	10.245 MHz, Crystal
	Z201	61.1384	Damping choke
	Z202	61.1384	Damping choke
RF5112	Z501	69.5037	10.7 MHz, Crystal filter
RF5113	Z501	69.5038	10.7 MHz, Crystal filter
RF5114	Z501	69.5039	10.7 MHz, Crystal filter
	Z502	69.5045	455 kHz, Ceram. filter
RF5114	Z502	69.5046	455 kHz, Ceram. filter

TYPE	NO	CODE	DATA
SME RF5114	C102	J701534P6	4.7 uF 20% Tantal
	C103	J701534P6	4.7 uF 20% Tantal
	C104	76.5142	47 nF 5% Polyester FL
	C106	J701534P4	1.0 uF 20% Tantal
	C107	J701534P6	4.7 uF 20% Tantal
	C108	76.5135	10nF 10% Polyester FL
	C108	76.5135	10 nF 10% Polyester FL
	C109	J700234P1	1 nF 5% Polyester FL
	C110	J701534P6	4.7 uF 20% Tantal
	C111	76.5151	68 nF 5% Polyester FL
	C112	74.5392	150 pF 20% Ceram DI
	C113	74.5374	18 pF 5% Ceram DI
	C114	74.5395	470 pF 20% Ceram DI
	C151	J700003P7	10 uF 20% Tantal
	C152	J700005P7	10 nF 10% Polyester FL
	C153	74.5386	180 pF 5% Ceram DI
	C154	74.5396	680 pF 20% Ceram DI
	C155	74.5405	68 pF 5% Ceram DI
	C156	74.5403	18 pF 5% Ceram DI
	C157	74.5370	8.2 pF 0.25 pF Ceram DI
	C158	74.5378	39 pF 5% Ceram DI
	C201	74.5392	150 pF 20% Ceram DI
C203	74.5377	33 pF 5% Ceram DI	
C204	74.5397	1 nF 20% Ceram DI	
C205	74.5397	1 nF 20% Ceram DI	
C206	74.5374	18 pF 5% Ceram DI	
C207	74.5377	33 pF 5% Ceram DI	
C208	79.5003	0.39 pF 5% Phenolic TB	
C209	74.5373	15 pF 5% Ceram DI	
C210	74.5377	33 pF 5% Ceram DI	
C211	J701534P2	0.22 uF 20% Tantal	
C212	74.5397	1 nF 20% Ceram DI	
C213	74.5397	1 nF 20% Ceram DI	
C214	74.5395	470 pF 20% Ceram DI	
C215	74.5374	18 pF 5% Ceram DI	
C216	74.5379	47 pF 5% Ceram DI	
C217	79.5005	0.56 pF 5% Phenolic TB	
C218	74.5372	12 pF 5% Ceram DI	
C219	74.5378	39 pF 5% Ceram DI	
C220	74.5397	1 nF 20% Ceram DI	
C221	74.5397	1 nF 20% Ceram DI	
C222	74.5397	1 nF 20% Ceram DI	

TYPE	NO	CODE	DATA
10V 25V	C223	74.5374	18 pF 5% Ceram DI
	C224	74.5374	18 pF 5% Ceram DI
	C225	74.5397	1 nF 20% Ceram DI
	C231	74.5371	10 pF 5% Ceram DI
	C232	74.5380	56 pF 5% Ceram DI
	C233	75.5026	110 pF 5% Mica
	C234	76.5144	0.1 uF 10% Polyester FL
	C235	74.5392	150 pF 20% Ceram DI
	C236	J701534P7	10 uF 20% Tantal
	C237	75.5028	220 pF 5% Mica
	C238	75.5030	68 pF 5% Mica
	C238	75.5020	100 pF 5% Mica
	C239	75.5019	10 pF 5% Siliv. Mica
	C240	75.5026	110 pF 5% Mica
	C241	75.5031	150 pF 5% Mica
	C241	75.5022	240 pF 5% Mica
	C242	75.5031	150 pF 5% Mica
	C242	75.5022	240 pF 5% Mica
	C243	76.5144	0.1 uF 10% Polyester FL
	C244	J706339P4	4.7 uF 20% SAL ELECTR. CAP
	C245	74.5392	150 pF 20% Ceram DI
	C246	75.5028	220 pF 5% Mica
C247	75.5027	130 pF 5% Mica	
C247	75.5032	82 pF 5% Mica	
C248	75.5025	30 pF 5% Teflon	
C249	75.5028	220 pF 5% Mica	
C250	75.5023	8.0 pF 0.5 pF Teflon	
C251	75.5024	22 pF 5% Teflon	
C252	75.5021	29 pF 2% Teflon	
C253	75.5023	8.0 pF 0.5 pF Teflon	
C254	74.5392	150 pF 20% Ceram DI	
C255	74.5361	1.5 pF 0.25 pF Ceram DI	
C258	J701534P7	10 uF 20% Tantal	
C259	J700234P7	10nF 10%	
C301	74.5396	680 pF 20% Ceram DI	
C302	J700234P7	10 nF 10% Polyester FL	
C303	74.5386	180 pF 5% Ceram DI	
C304	74.5396	680 pF 20% Ceram DI	
C305	74.5405	68 pF 5% Ceram DI	
C306	74.5403	18 pF 5% Ceram DI	
C307	74.5369	6.8 pF 0.25 pF Ceram	
C308	74.5386	180 pF 5% Ceram DI	

RF UNIT RF5110

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TYPE	Nº	CODE	DATA
	C309	79.5005	0.56 pF 5% Phenolic TB
	C310	74.5373	15 pF 5% Ceram DI
	C311	74.5379	47 pF 5% Ceram DI
	C312	J701534P6	4.7 uF 20% Tantal
	C313	74.5375	22 pF 5% Ceram DI
	C401	74.5370	8.2 pF 0.25 pF Ceram DI
	C402	74.5370	8.2 pF 0.25 pF Ceram DI
	C403	79.5006	0.68 pF 5% Phenolic TB
	C404	74.5395	470 pF 20% Ceram DI
	C405	74.5395	470 pF 20% Ceram DI
	C406	74.5395	470 pF 20% Ceram DI
	C407	74.5370	8.2 pF 0.25 pF Ceram DI
	C408	74.5370	8.2 pF 0.25 pF Ceram DI
	C409	79.5001	0.22 pF 5% Phenolic TB
	C410	74.5361	1.5 pF 0.25 pF Ceram DI
	C411	74.5368	5.6 pF 0.25 pF Ceram
	C412	J700234P4	3.3 nF 10% Polyester FL
	C413	J700234P7	10 nF 10% Polyester FL
	C414	J706280P1	2.2 nF 10% Ceramic 2DI
	C415	74.5389	330 pF 5% Ceram DI
	C501	74.5375	22 pF 5% Ceram DI
	C502	74.5395	470 pF 20% Ceram DI
	C503	J700005P7	10 nF 10% Polyester FL
	C504	J700005P7	10 nF 10% Polyester FL
	C505	J700005P7	10 nF 10% Polyester FL
	C506	74.5379	47 pF 5% Ceram DI
	C507	74.5383	100 pF 5% Ceramic DI
	C508	74.5387	220 pF 5% Ceram DI
	C509	J700234P5	4.7 nF 10% Polyester FL
	C510	J701534P4	1.0 uF 20% Tantal
	C511	73.5168	0.22 uF 20% Tantal
	C512	J701534P4	1.0 uF 20% Tantal
	C513	J701534P4	1.0 uF 20% Tantal
	C514	J700003P4	1.0 uF 20% Tantal
	C515	73.5168	0.22 uF 20% Tantal
	C516	73.5168	0.22 uF 20% Tantal
	C517	74.5393	220 pF 20% Ceram DI
	C518	74.5393	220 pF 20% Ceram DI
	C519	74.5397	1 nF 20% Ceram DI
	C520	J701534P4	1.0 uF 20% Tantal
	C521	73.5166	470 uF -10+100% Elco
	C522	J700234P4	3.3 nF 10% Polyester FL

TYPE	Nº	CODE	DATA
	C601	J700234P5	4.7 nF 10% Polyester FL
	C602	J700234P6	6.8 nF 10% Polyester FL
	C603	J700234P11	47 nF 10% Polyester FL
	C604	J701534P6	4.7 uF 20% Tantal
	C605	73.5164	47 uF -10+100% Elco
	C606	J701534P4	1.0 uF 20% Tantal
	C607	73.5169	0.47 uF 20% Tantal
	C608	76.5144	0.1 uF 10% Polyester FL
	C609	J701534P6	4.7 uF 20% Tantal
	C610	J701534P9	47 uF 20% Tantal
	C611	76.5144	0.1 uF 10% Polyester FL
	C612	73.5168	0.22 uF 20% Tantal
	C613	76.5148	0.47 uF 10% Polyester FL
	C614	73.5166	470 uF -10+100% Elco
	C615	76.5143	68 nF 10% Polyester FL
	C616	76.5143	68 nF 10% Polyester FL
	C617	73.5164	47 uF -10+100% Elco
	C618	73.5165	220 uF -10+100% Elco
	C620	74.5395	470 pF 20% Ceram DI
	C621	74.5395	470 pF 20% Ceram DI
	D101	99.5374	1H458A Diode, selected
	D102	99.5374	1H458A Diode, selected
	D151	99.5341	Cap. Diode
	D152	99.5237	1H4148 Diode
	D201	99.5237	1H4148 Diode
	D301	99.5341	Cap. Diode
	D501	99.5237	1H4148 Diode
	D502	99.5237	1H4148 Diode
	D601	99.5237	1H4148 Diode
	D602	99.5237	1H4148 Diode
	D603	99.5237	1H4148 Diode
	D604	99.5237	1H4148 Diode
	D605	99.5237	1H4148 Diode
	D606	99.5303	1.6 V LED
	D607	99.5237	1H4148 Diode
	J151	41.5529	Socket
	J301	41.5529	Socket
	J601	41.5165	UIIF connector
	K601	58.5085	21-21 Relay
	L151	61.5032	48-58 MHz RF coil
	L152	61.5030	1.5 uH 10% PF choke
	L153	61.5041	146-174 MHz RF coil

TYPE	NO	CODE	DATA
	L154	61.5031	10 uH 10% RF choke
	L155	61.5030	1.5 uH 10% RF choke
	L202	61.5028	0.1 uH 10% RF choke
	L203	J709078PI	RF choke
	L204	61.5036	146-174 MHz RF coil
	L205	61.5036	146-174 MHz RF coil
	L206	61.5029	1.0 uH 10% RF choke
	L207	61.5028	0.1 uH 10% RF choke
	L208	61.5036	146-174 MHz RF coil
	L209	61.5036	146-174 MHz RF coil
	L211	61.5029	1.0 uH 10% RF choke
	L212	62.0982	146-174 MHz RF coil
	L213	62.0982	146-174 MHz RF coil
	L221	61.5031	10 uH 10% RF choke
	L224	62.0987	146-174 MHz RF coil
	L225	62.0985	146-174 MHz RF coil
	L225	62.0988	146-174 MHz RF coil
	L226	62.0979	146-174 MHz RF coil
	L227	J709078PI	RF choke
	L228	62.0986	146-174 MHz RF coil
	L228	62.1030	AIR RF coil
	L229	62.0979	146-174 MHz RF coil
	L229	62.0983	146-174 MHz RF coil
	L230	62.0984	AIR RF coil
	L230	62.1031	146-174 MHz RF coil
	L232	62.0981	146-174 MHz RF coil
	L234	62.0981	146-174 MHz RF coil
	L235	62.0980	146-174 MHz RF coil
	L236	62.0981	146-174 MHz RF coil
	L237	62.0979	146-174 MHz RF coil
	L238	62.0981	146-174 MHz RF coil
	L239	62.0980	146-174 MHz RF coil
	L301	61.5034	45-55 MHz RF coil
	L302	61.5015	3.3 uH 10% RF choke
	L303	61.5041	146-174 MHz RF coil
	L305	61.5035	135-164 MHz RF coil
	L401	61.5037	146-174 MHz RF coil
	L402	61.5037	146-174 MHz RF coil
	L403	61.5037	146-174 MHz RF coil
	L404	61.5037	146-174 MHz RF coil
	L405	61.5039	146-174 MHz RF coil
	L406	61.5050	10.7-21.4 MHz RF coil
25 V			0.3 A
10 V			0.8 A
			1.3 A
			0.65 A
			1.3 A
			0.65 A
			0.3 A
25 V			0.7 A

TYPE	NO	CODE	DATA
	L501	61.5026	10.7 MHz IF transformer
	L502	61.5026	10.7 MHz IF transformer
	L503	61.5025	455 kHz IF transformer
	L504	61.5025	455kHz IF transformer
	L601	61.5023	75 uH 10% RF choke
	P101	41.5541	Fem. connector
	P201	41.5545	Fem. connector
	P901	41.5541	Fem. connector
	P903	41.0230	Fem. connector
	Q151	99.5347	PI2369 Transistor
	Q201	99.5348	Transistor
	Q202	99.5348	Transistor
	Q203	99.5348	Transistor
	Q204	99.5349	RF transistor
	Q205	99.5342	PA Transistor
	Q206	99.5343	PA Transistor
	Q206	99.5344	PA Transistor
	Q207	99.5345	BD201 Transistor
	Q208	99.5251	BC307 Transistor
	Q209	99.5121	BC237 Transistor
	Q210	99.5121	BC237 Transistor
	Q301	99.5347	PI2369 Transistor
	Q302	99.5347	PI2369 Transistor
	Q401	99.5239	BFY90 Transistor
	Q402	99.5245	2N5245 J-FET
	Q501	99.5291	3N205 Mos-FET
	Q601	99.5143	BC238 Transistor
	Q602	99.5201	BC239 Transistor
	Q603	99.5115	BC309 Transistor
	Q604	99.5115	BC309 Transistor
	Q605	99.5115	BC309 Transistor
	R102	80.5265	22 Kohm 5% Carbon film
	R103	80.5243	330 ohm 5% Carbon film
	R104	89.5095	51 Kohm 5% Carbon film
	R105	89.5083	10.5Kohm 1% Metal film
	R106	89.5085	12.7Kohm 1% Metal film
	R107	89.5083	10.5 kohm 1% Metal film
	R108	89.5082	5.11 Kohm 1% Metal film
	R109	89.5091	1.3 Kohm 5% Carbon film
	R109	80.5252	1.8Kohm 10% Carbon film
	R109	80.5252	1.8 Kohm 5% Carbon film
	R110	89.5082	5.11 Kohm 1% Metal film
S/E RF51114			0.01 A
			4 PIN
			3 PIN
			4 PIN
			7 PIN

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RF UNIT RF5110

TYPE	NO	CODE	DATA
	R603	80.5243	330 ohm 5% Carbon film
	R604	80.5264	18 Kohm 5% Carbon film
	R605	80.5261	10 Kohm 5% Carbon film
	R606	80.5278	270 Kohm 5% Carbon film
	R607	J708394P8	10 Kohm 20% Carbon pot.
	R608	80.5259	6.8 Kohm 5% Carbon film
	R609	89.5053	470 ohm 20% NTC
	R610	80.5260	8.2 Kohm 5% Carbon film
	R611	80.5238	120 ohm 5% Carbon film
	R612	80.5245	470 ohm 5% Carbon film
	R613	80.5248	820 ohm 5% Carbon film
	R614	80.5256	3.9 Kohm 5% Carbon film
	R615	80.5269	47 Kohm 5% Carbon film
	R616	80.5261	10 Kohm 5% Carbon film
	R617	80.5280	390 Kohm 5% Carbon film
	R618	80.5262	12 Kohm 5% Carbon film
	R619	80.5266	27 Kohm 5% Carbon film
	R620	80.5266	27 Kohm 5% Carbon film
	R621	80.5252	1.8 Kohm 5% Carbon film
	R622	80.5243	330 ohm 5% Carbon film
	R623	80.5259	6.8 Kohm 5% Carbon film
	R624	80.5261	10 Kohm 5% Carbon film
	R625	89.5093	3 Kohm 5% Carbon film
	R626	80.5249	1 Kohm 5% Carbon film
	R627	80.5240	180 ohm 5% Carbon film
	R628	80.5239	150 ohm 5% Carbon film
	R629	80.5260	8.2 Kohm 5% Carbon film
	R630	86.5077	47 Kohm 20% Carbon pot.
	R631	80.5229	22 ohm 5% Carbon film
	R632	80.5213	1 ohm 5% Carbon film
	R633	80.5238	120 ohm 5% Carbon film
	R634	80.5213	1 ohm 5% Carbon film
	R635	80.5234	56 ohm 5% Carbon film
	R636	80.52XX	6.8-270 ohm 5% Carbon film
	R637	80.5247	680 ohm 5% Carbon film
	R638	80.5413	1 ohm 5% Carbon film
	R639	80.5237	100 ohm 5% Carbon film
	S601	B800563P1	Switch
	S602	B800563P1	Switch
	T201	61.1385	PF transformer
	U101	14.5141	4558 Dual OP amp.
	U501	14.5128	CA3054 IF amplifier

TYPE	NO	CODE	DATA
	U502	14.5129	TBA750 IF amp/detec.
	U601	14.5130	TDA2002 AF amplifier
	U602	14.0133	Voltage reg.
	Y501	98.5010	10.245 MHz Crystal
	Z201	J709081G3	Damping choke
	Z202	J709081G3	Damping choke
RF5112	Z501	69.5037	10.7 MHz Crystal filter
RF5113	Z501	69.5038	10.7 MHz Crystal filter
RF5114	Z501	69.5039	10.7 MHz Crystal filter
	Z502	69.5045	455 kHz Ceram. filter
RF5114	Z502	69.5046	455 kHz Ceram. filter



TO SPEAKER

PA SUPPLY

TO ANTENNA RELAY

CHANNEL GUARD

TX AUDIO PROCESSOR

SPKR HI
SPKR LO

A+
8.5V TX
A-

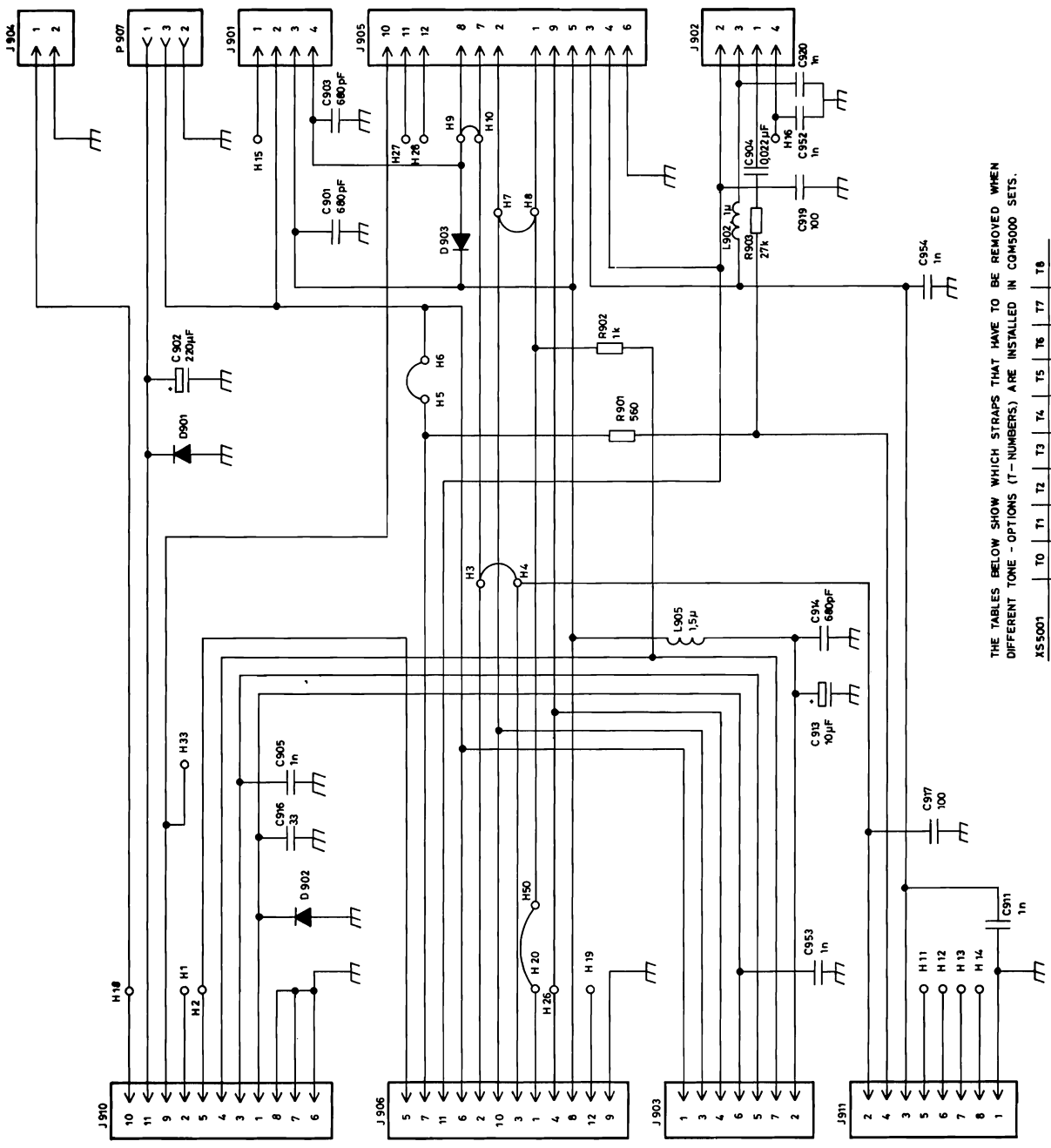
8.5V RX
8.5V TX
8.5V CONT
PTT (DLVD)

CG DIS
SPARE
SPARE

PTT (DLVD)
PTT
VOL/SQ HI

FLTR'D VOL/SQ HI
RX MUTE
8.5V CONT
CG LO
TONE OUTPUT
A-

CG HI
TX AUDIO
MIC LO
MIC HI
COMP/TX AUDIO



INTERNAL SPKR HI
A.
(CG DISABLE)
SPARE
CG DISABLE/TONE KEY
FLTR'D VOL/SQ HI
SPKR HI
A.
A-
SPKR LO
A-

ALTERNATIVE FUNCTIONS WITH CHANNEL GUARD
CG DISABLE - - - - - TONE KEY
MIC BLOCK
TONE OUTPUT
8.5V TX
PTT (TO RELAY)
VOL/SQ HI
PTT
FLTR'D VOL/SQ HI - - - - - ALARM
RX MUTE
8.5V TX
MUTE
A-

FIVE
TONE
SEQ
FLTR'D VOL/SQ HI - - - - - ALARM
RX MUTE
8.5V TX
MUTE
A-

8.5V TX
VOL/SQ HI
RX MUTE
A.
SPKR HI
FLTR'D VOL/SQ HI
8.5V TX

PTT
MIC HI
MIC LO
CHAN. COM.
FREQ BIT 2
FREQ BIT 1
FREQ BIT 0
A.

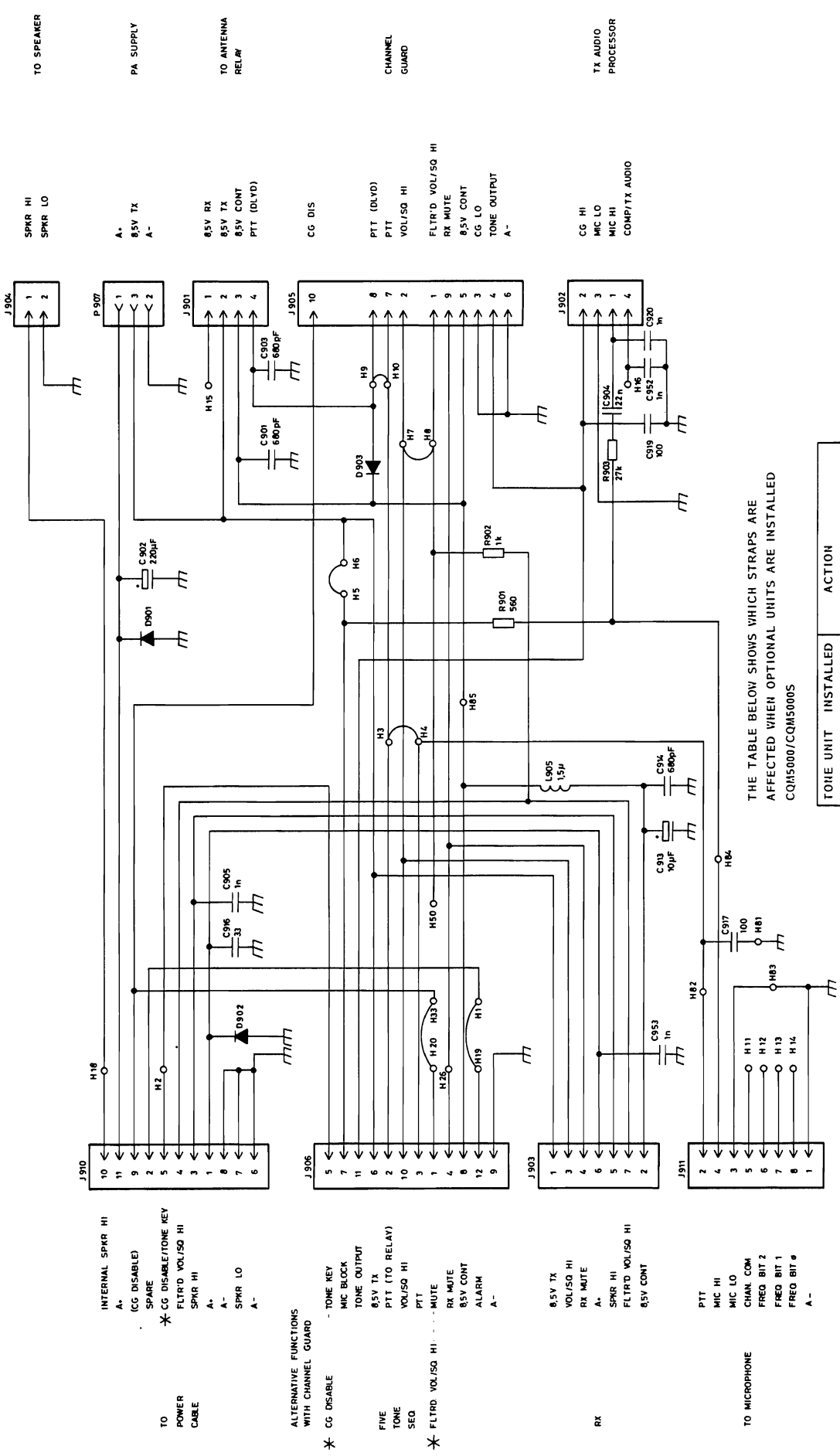
THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (T-NUMBERS) ARE INSTALLED IN COM5000 SETS.

	T0	T1	T2	T3	T4	T5	T6	T7	T8
X55001	+	-	-	-	-	+	+	+	+
H3 - H4	+	-	-	-	-	+	+	+	+
H5 - H6	+	-	-	-	-	+	+	+	+
H7 - H8	+	+	+	+	+	-	-	-	-
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	-	-	-	-	+	+	+	+

INTERCONNECT UNIT

XS 5001

D402.615



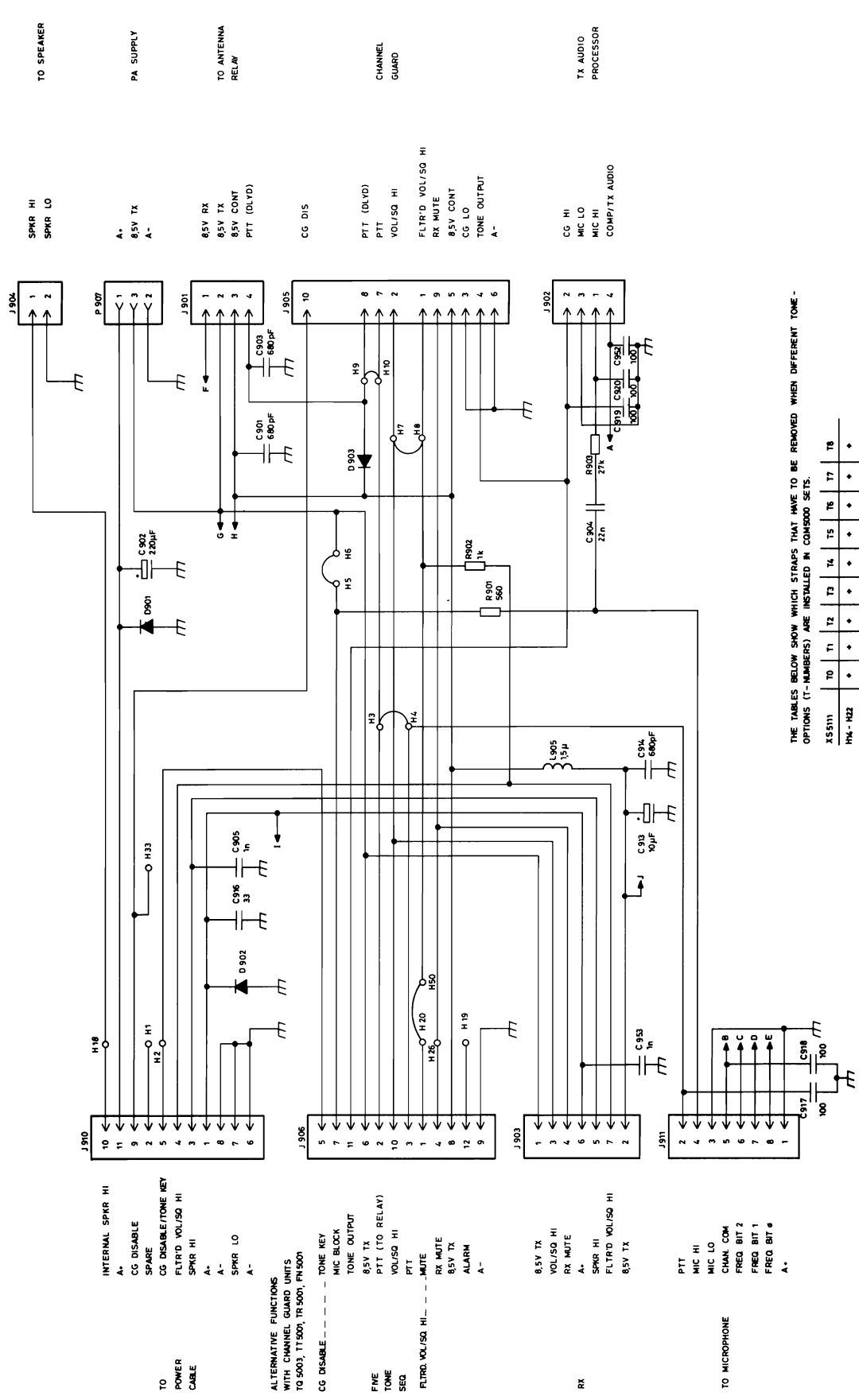
THE TABLE BELOW SHOWS WHICH STRAPS ARE AFFECTED WHEN OPTIONAL UNITS ARE INSTALLED CQM5000/CQM5000S

TO NE UNIT INSTALLED	ACTION
TQ5001	CUT
TQ5002	CUT H3-H4, H5-H6
TQ5004	CUT
CL5001	CUT
TQ5006	CUT H7-H8, H9-H10, H20-H33
TR5002	CUT H7-H8, H20-H33
TT5002	CUT H9-H10, H20-H33

* ALTERNATIVE FUNCTIONS WITH CG UNITS: TG 5003, ST 5001, SR 5001, FN 5001

INTERCONNECT UNIT
XS 5001

D402.615/3



SPKR HI
SPKR LO

A+
8.5V TX
A-

8.5V RX
8.5V TX
8.5V CONT
PTT (DLVD)

CG DIS

PTT (DLVD)
PTT
VOL/SQ HI

FLTRD VOL/SQ HI
RX MUTE
8.5V CONT
CG LO
TONE OUTPUT
A-

CG HI
MIC LO
MIC HI
COMP/TX AUDIO

TO SPEAKER

PA SUPPLY

TO ANTENNA RELAY

CHANNEL GUARD

TX AUDIO PROCESSOR

INTERNAL SPKR HI
A+
CG DISABLE
SPARE
CG DISABLE/TONE KEY
CG DISABLE/TONE KEY
FLTRD VOL/SQ HI
SPKR HI
A+
A-
SPKR LO
A-

TO POWER CABLE

ALTERNATIVE FUNCTIONS WITH CHANNEL GUARD UNITS TO 5003, TT5001, TR5001, FN5001

CG DISABLE - - - -

TONE KEY
MIC BLOCK
TONE OUTPUT
8.5V TX
PTT (TO RELAY)
VOL/SQ HI
PTT
FLTRD VOL/SQ HI
RX MUTE
8.5V TX
ALARM
A-

8.5V TX
VOL/SQ HI
RX MUTE
A+
A-
SPKR HI
FLTRD VOL/SQ HI
8.5V TX

RX

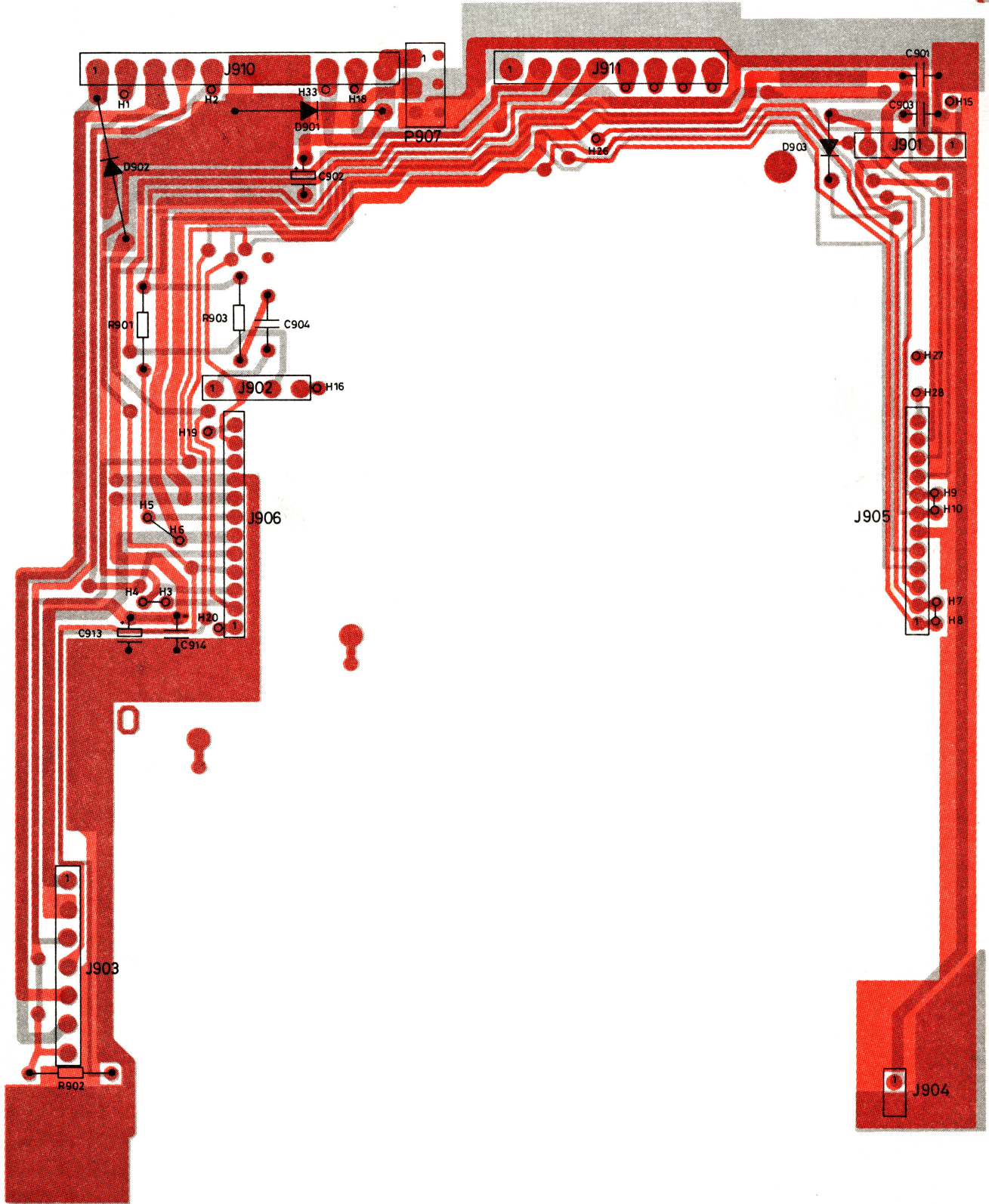
PTT
MIC HI
MIC LO
CHAN. COM
FREQ. BIT 2
FREQ. BIT 1
FREQ. BIT 0
A+

TO MICROPHONE

THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE-OPTIONS (T-NUMBERS) ARE INSTALLED IN COMBIO SETS.

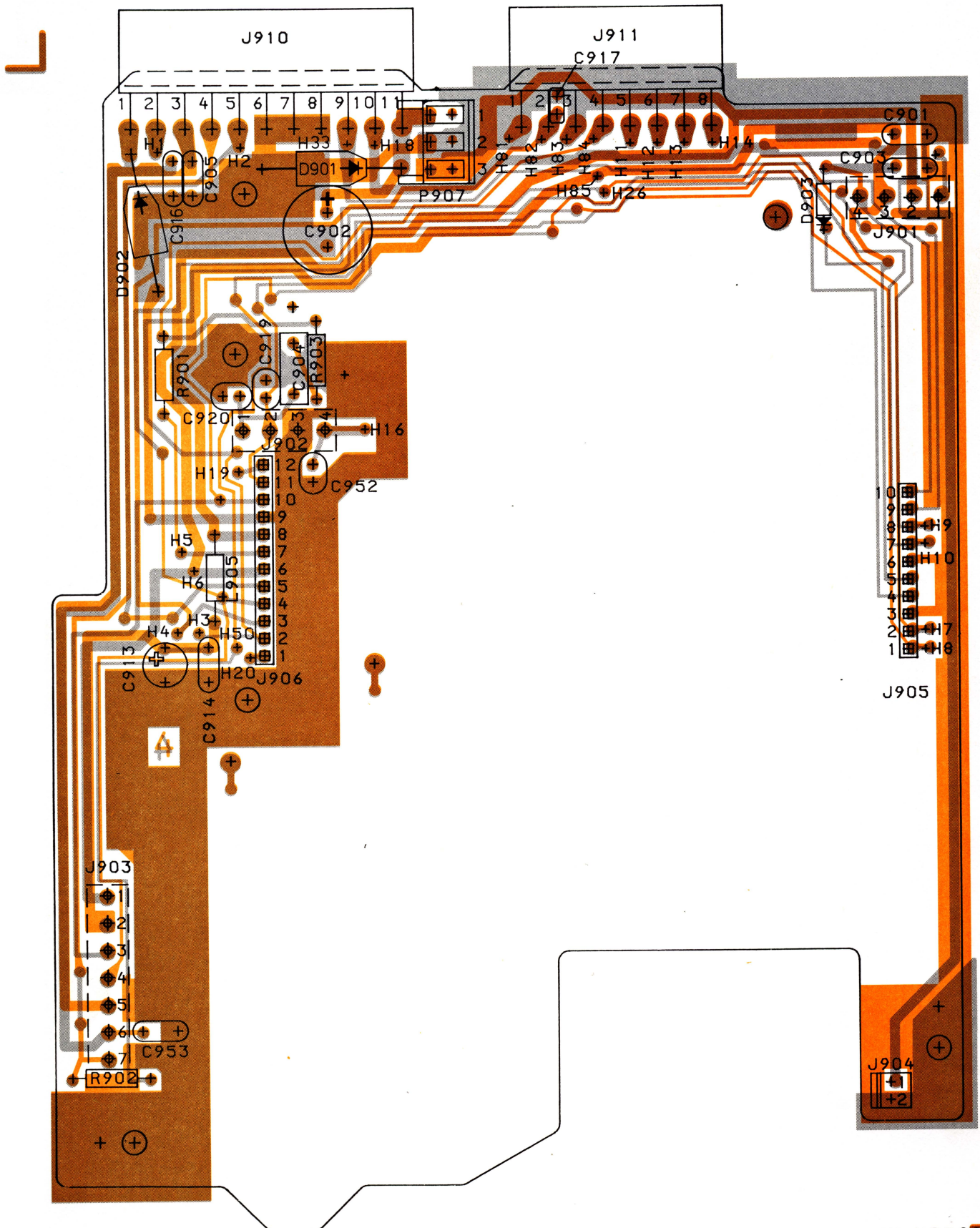
XS5111	T0	T1	T2	T3	T4	T5	T6	T7	T8
HK - H22	*	*	*	*	*	*	*	*	*
H3 - H23	*	*	*	*	*	*	*	*	*
H7 - H25	*	*	*	*	*	*	*	*	*
H2 - H29	*	*	*	*	*	*	*	*	*
H0 - H20	*	*	*	*	*	*	*	*	*
H5 - H4	*	*	*	*	*	*	*	*	*
H5 - H6	*	*	*	*	*	*	*	*	*
H7 - H6	*	*	*	*	*	*	*	*	*
H8 - H10	*	*	*	*	*	*	*	*	*
H20 - H20	*	*	*	*	*	*	*	*	*

CHANNEL SELECTOR UNIT
XS 5111



INTERCONNECT UNIT
XS 5001

D402.637



INTERCONNECT UNIT XS50T
COMPONENT LAYOUT

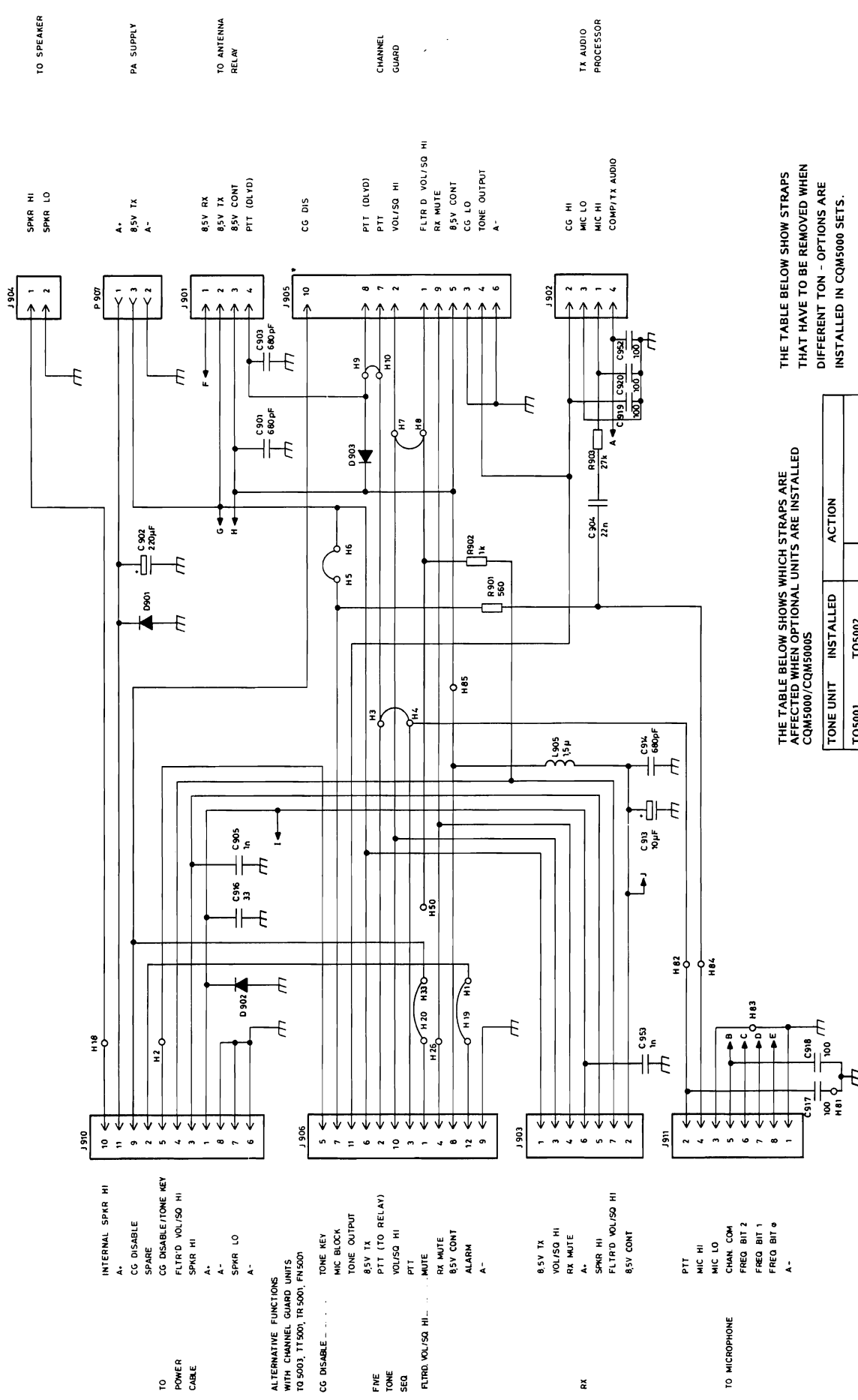
D402.637/2

TYPE	NO	CODE	DATA
	C901	74. 5396	680pF 20% Ceram DI
	C902	73. 5165	220uF -10/+100% Elco
	C903	74. 5396	680pF 20% Ceram DI
	C904	74. 5141	22nF 5% Polyest FL
	C905	74. 5397	1 nF 20% Ceram
	C913	73. 5173	10 uF 20% Tantal
	C914	74. 5396	680 pF 20% Ceram
	C916	76. 5141	22 nF 20% Polyest. Fl.
	C917	74. 5391	100 pF 20% Ceram
	C919	74. 5391	100 pF 20% Ceram
	C920	74. 5397	1 nF 20% Ceram
	C952	74. 5397	1 nF 20% Ceram
	C953	74. 5397	1 nF 20% Ceram
	D901	99. 5220	1N5401 Diode
	D902	99. 5220	1N5401 Diode
	D903	99. 5237	1N4148 Diode
	J901	41. 0728	Male connector
	J902	41. 0228	Male connector
	J903	41. 0229	Male connector
	J904	41. 0225	Male connector
	J905	41. 0227	Male connector
	J906	41. 0227	Male connector
	J907	41. 5544	Fem. connector
	J910	41. 0232	Male connector
	L902	61. 5029	1. 0 uH 10% RF choke
	L905	61. 5030	1. 5 uH 10% RF choke
	R901	80. 5246	560 ohm 5% Carbon film
	R902	80. 5249	1 Kohm 5% Carbon film
	R903	80. 5265	27 Kohm 5% Carbon film

TYPE	NO	CODE	DATA

INTERCONNECT UNIT XS5001

X402. 648/2



TO SPEAKER
 SPKR HI
 SPKR LO

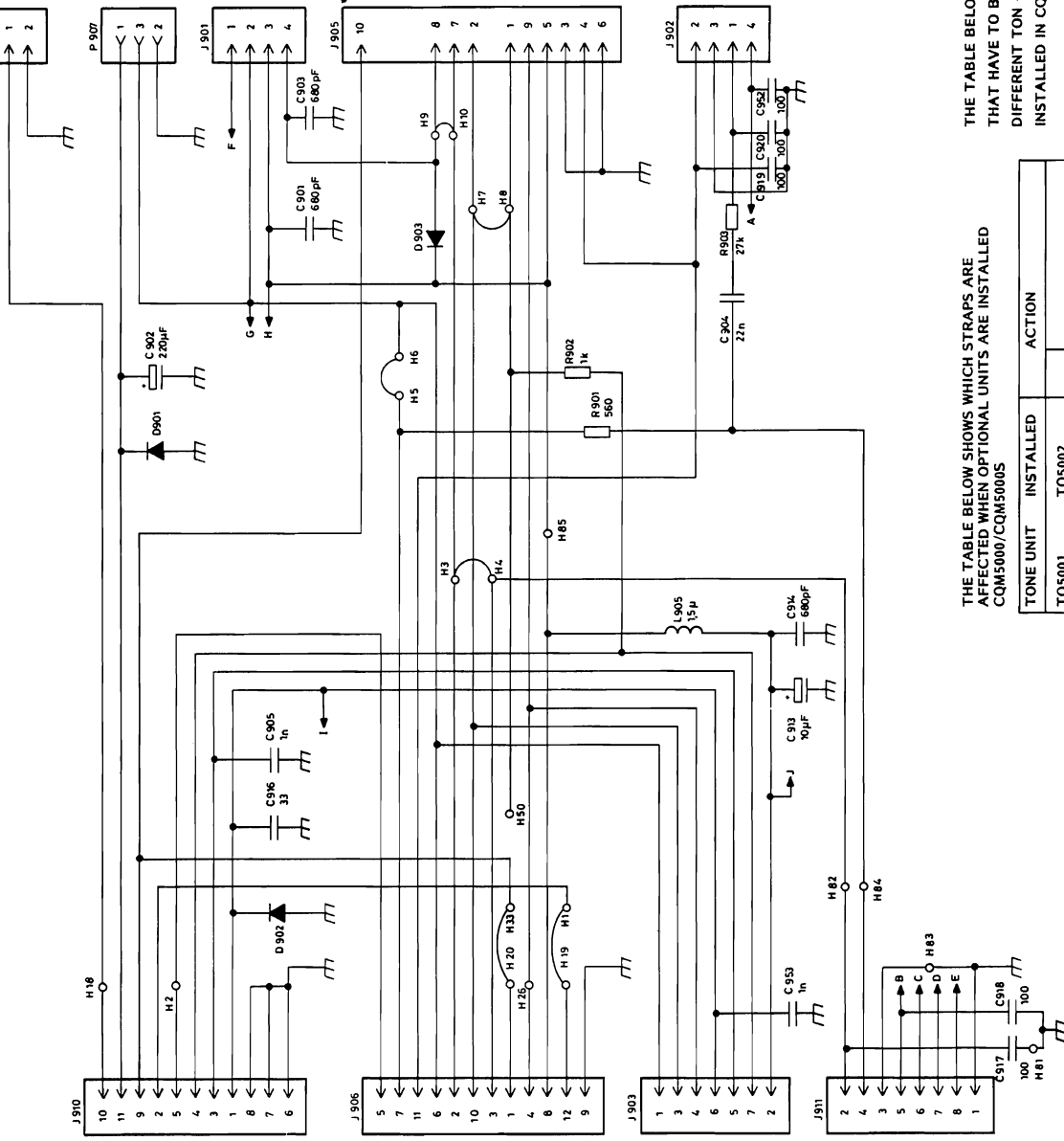
PA SUPPLY
 A+ 8.5V TX
 A-

TO ANTENNA RELAY
 8.5V RX
 8.5V TX
 8.5V CONT
 PTT (DLVD)

CHANNEL GUARD
 CG DIS

PTT (DLVD)
 PTT
 VOL/SQ HI
 FLTR D VOL/SQ HI
 RX MUTE
 8.5V CONT
 CG LO
 TONE OUTPUT
 A-

TK AUDIO PROCESSOR
 CG HI
 MIC LO
 MIC HI
 COMP/TX AUDIO



INTERNAL SPKR HI
 A- CG DISABLE
 SPARE
 CG DISABLE/TONE KEY
 FLTR'D VOL/SQ HI
 SPKR HI
 A+
 A- SPKR LO
 A-

ALTERNATIVE FUNCTIONS WITH CHANNEL GUARD UNITS TO 5003, TT5001, TR5001, FN5001
 CG DISABLE -

FINE TONE SEQ
 FLTR'D VOL/SQ HI

RX
 8.5V TX VOL/SQ HI
 RX MUTE
 A-
 SPKR HI
 FLTR'D VOL/SQ HI
 8.5V CONT

PTT
 MIC HI
 MIC LO
 CHAN COM
 FREQ BIT 2
 FREQ BIT 1
 FREQ BIT 0
 A-

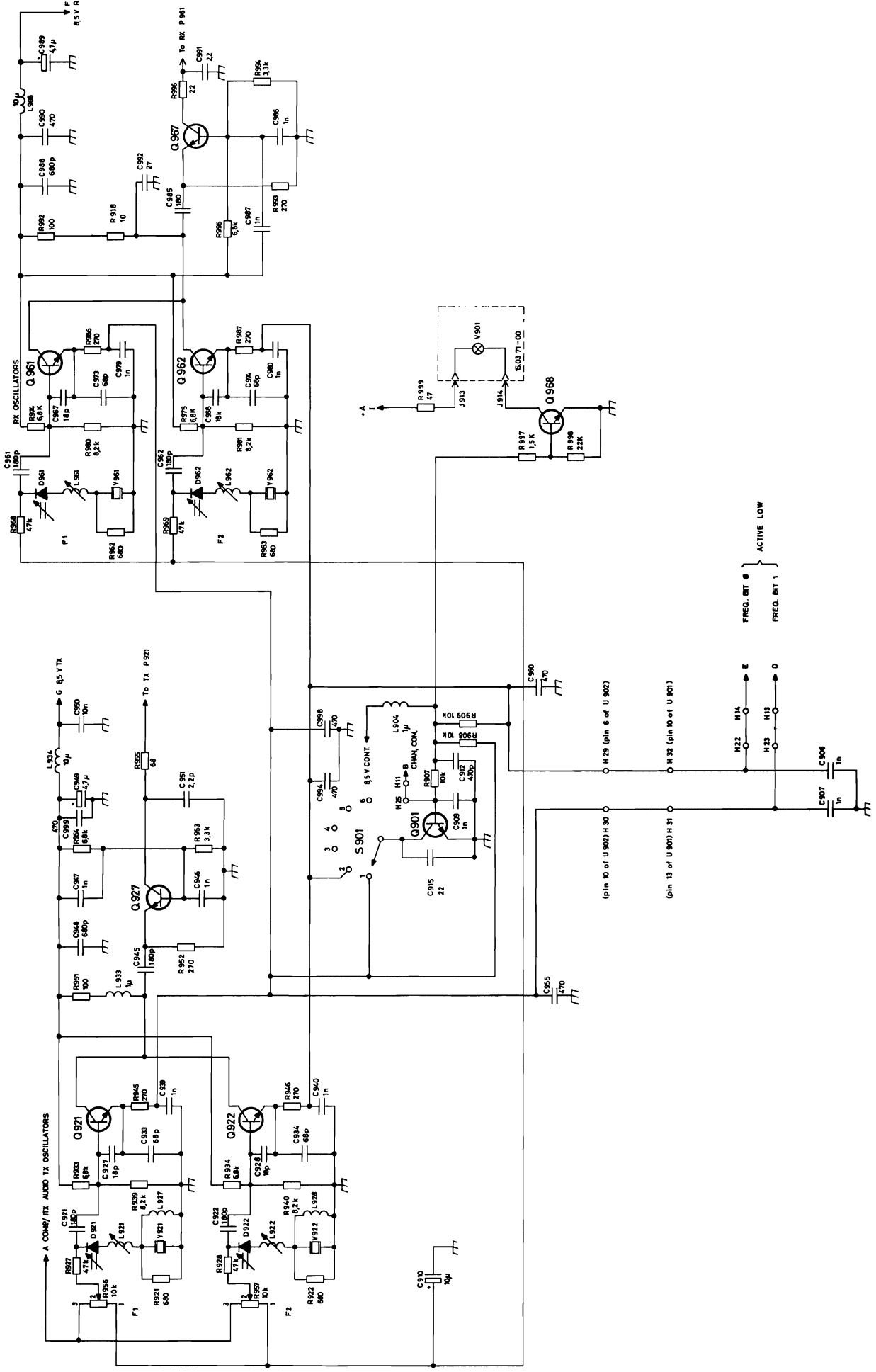
TO MICROPHONE

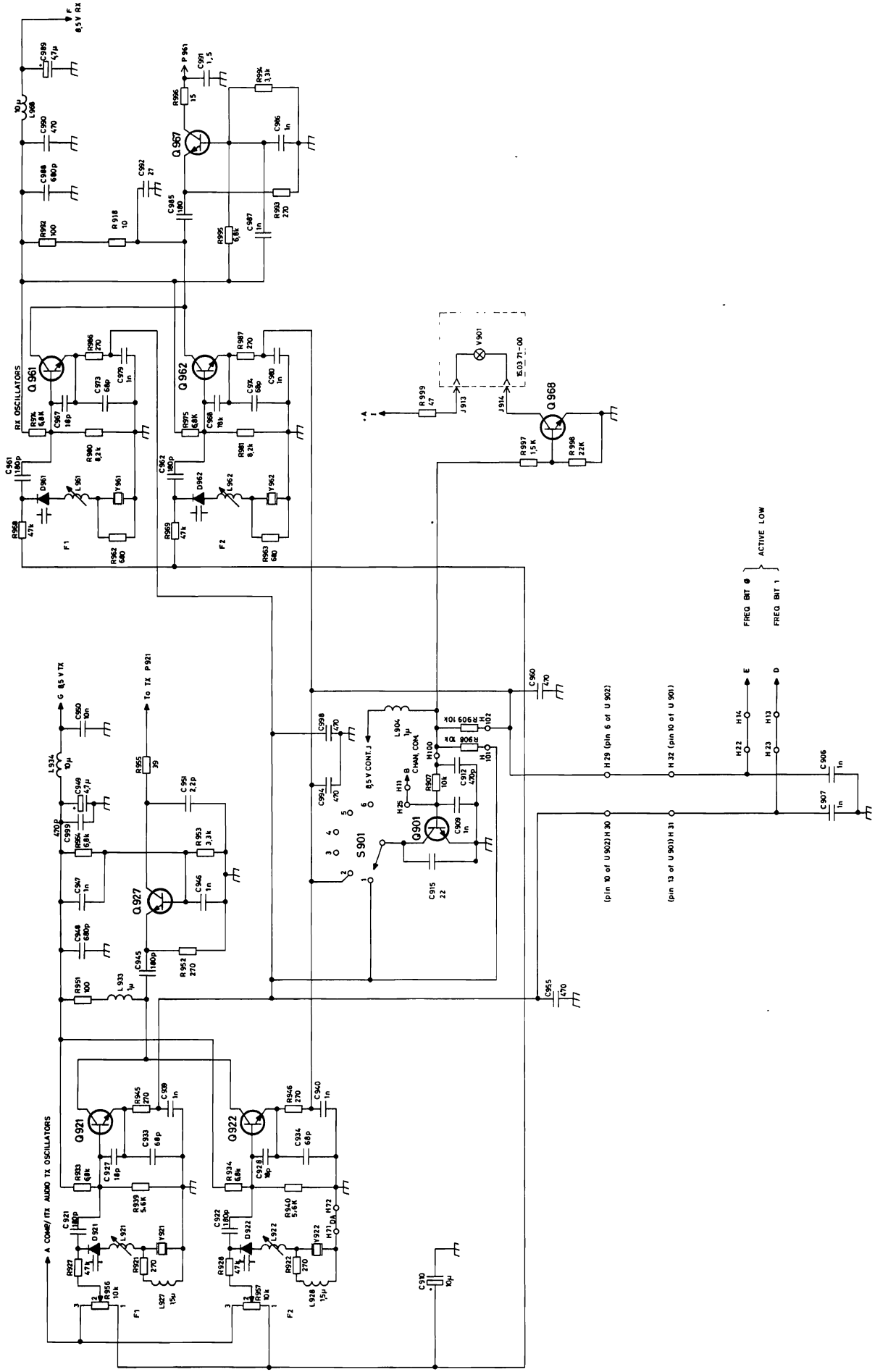
THE TABLE BELOW SHOWS WHICH STRAPS ARE AFFECTED WHEN OPTIONAL UNITS ARE INSTALLED

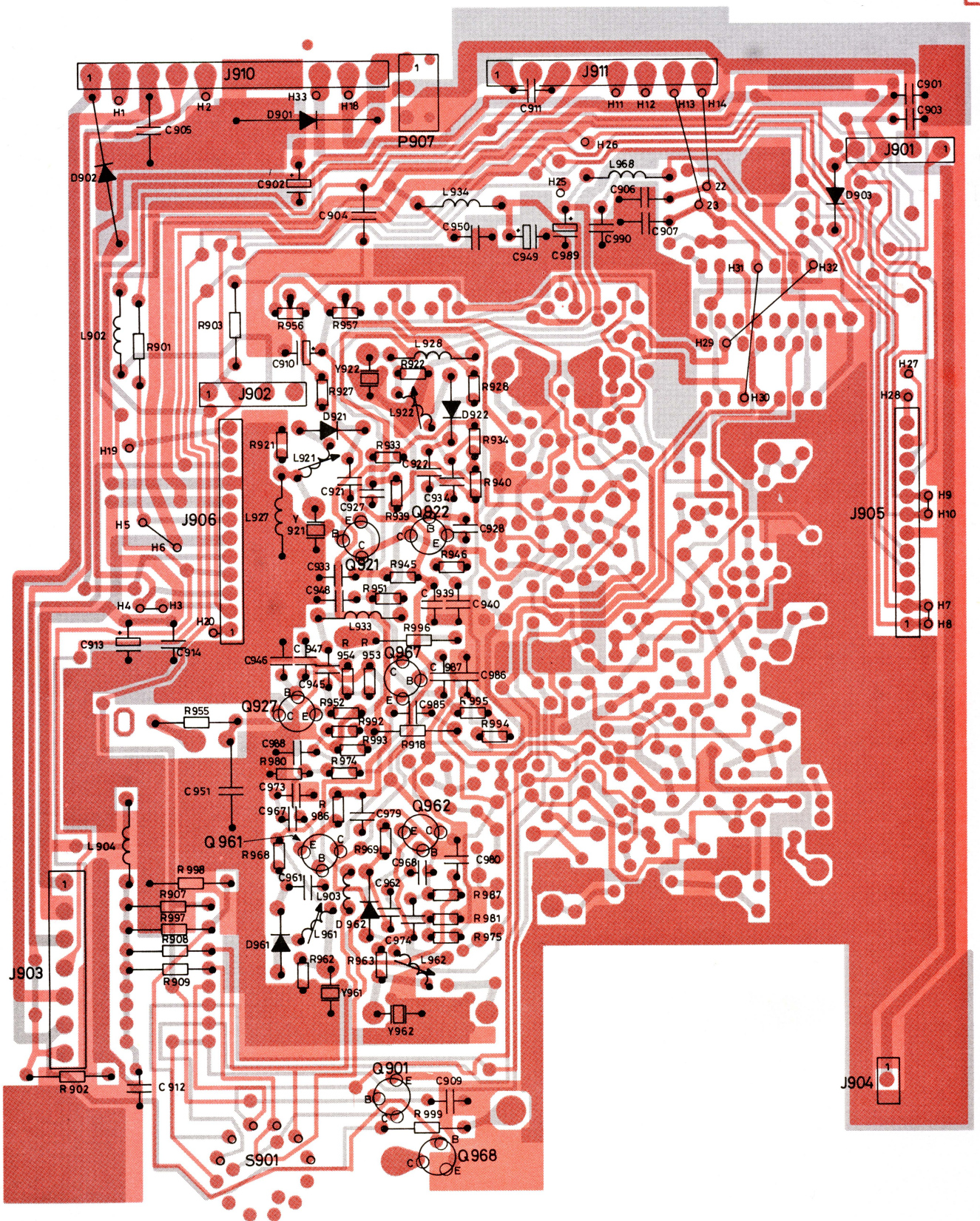
TO	FROM	OPTIONAL UNIT	ACTION
TO5001	TO5002	TQ5005	CUT
TO5004	TQ5005		
CL5001		FN5002	CUT
TQ5006			
TR5002	FN5002	TT5002	CUT

THE TABLE BELOW SHOWS STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TON - OPTIONS ARE INSTALLED IN COM5000 SETS.

CHANNEL SELECTOR UNIT
 XS 5111



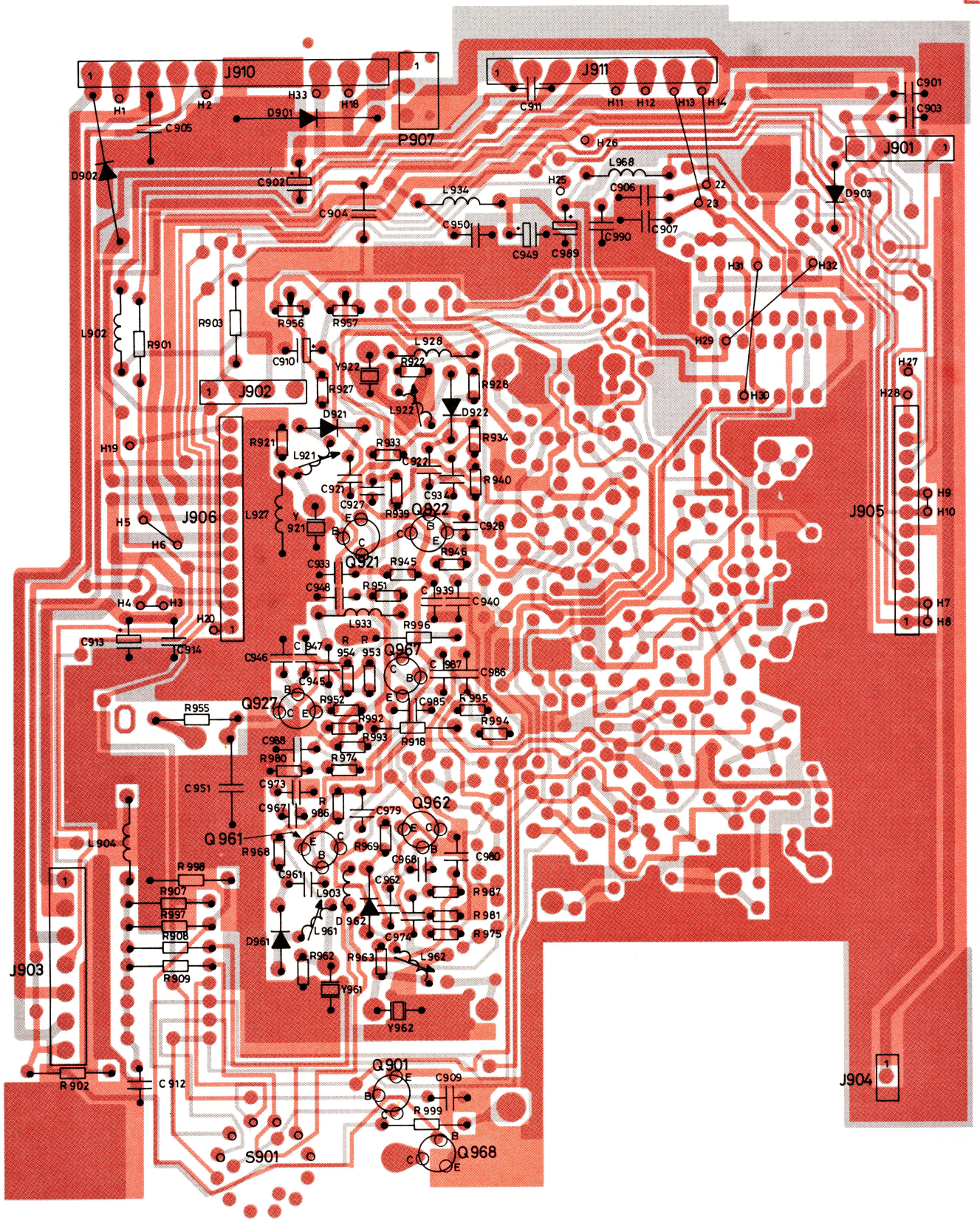




CHANNEL SELECTOR UNIT XS 511
INTERCONNECTION SECTION

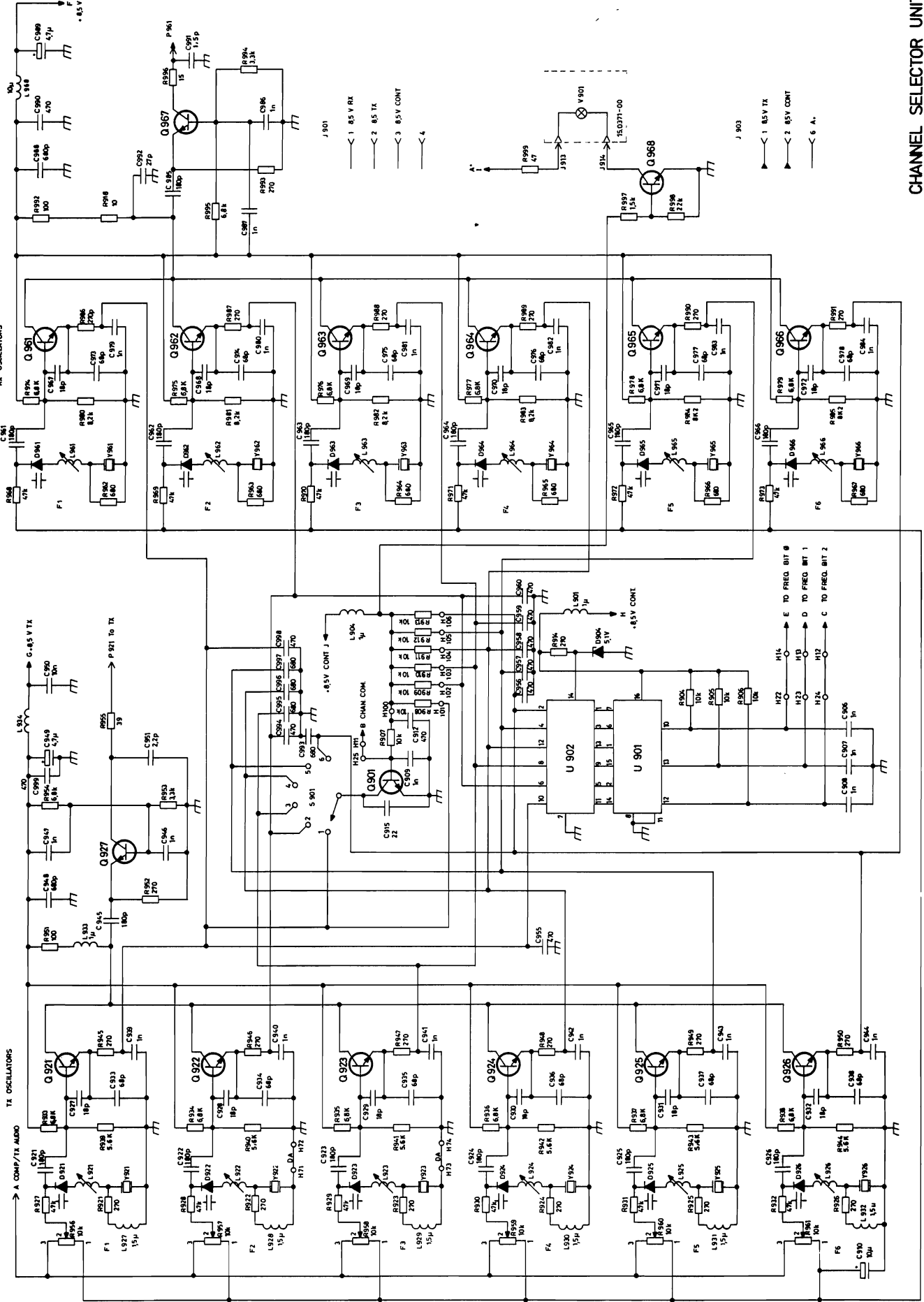
D402.617

13

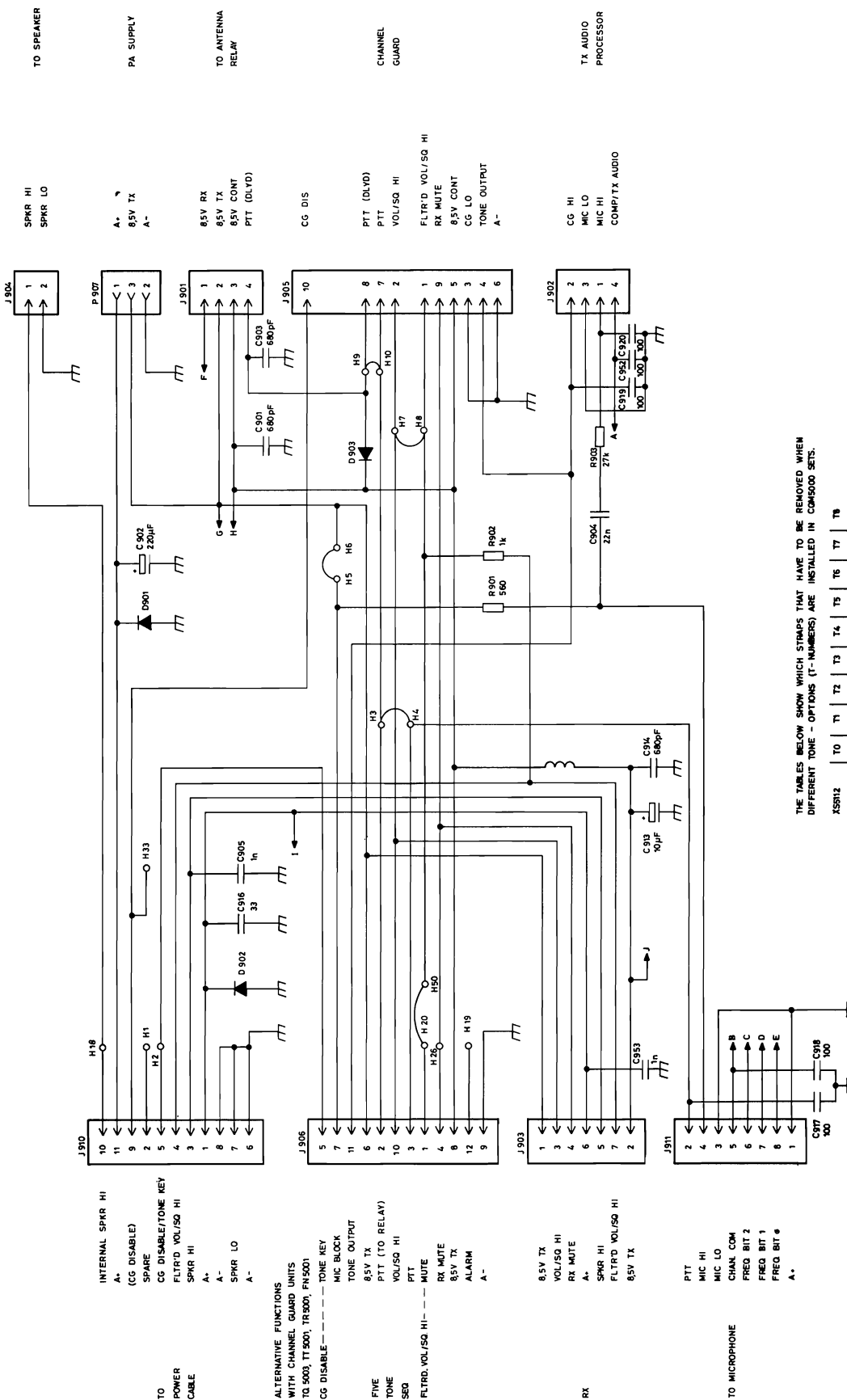


CHANNEL SELECTOR UNIT XS 511
INTERCONNECTION SECTION

D402.617



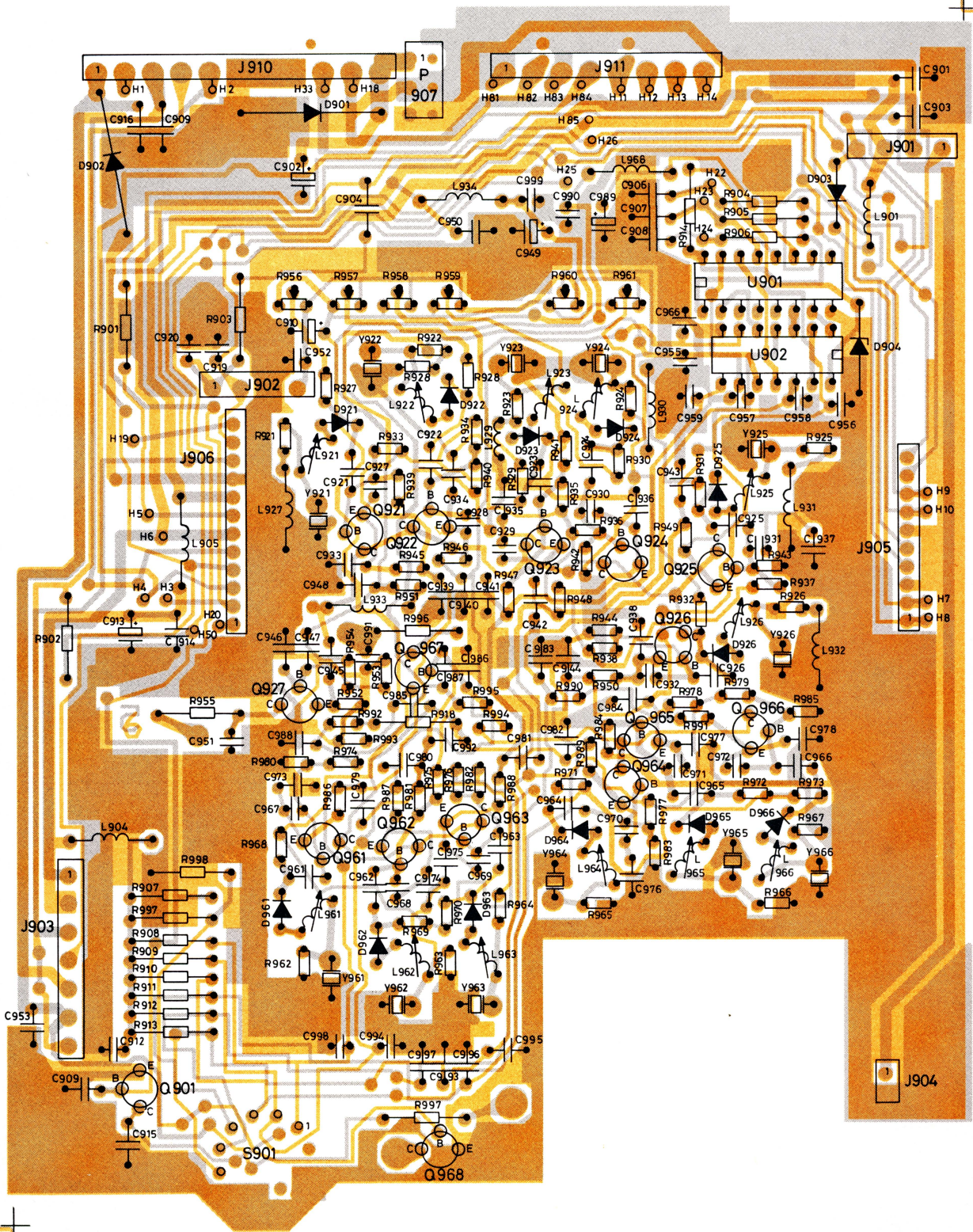
CHANNEL SELECTOR UNIT XS 5112
OSCILLATOR SECTION



THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (T-NUMBERS) ARE INSTALLED IN COM5000 SETS.

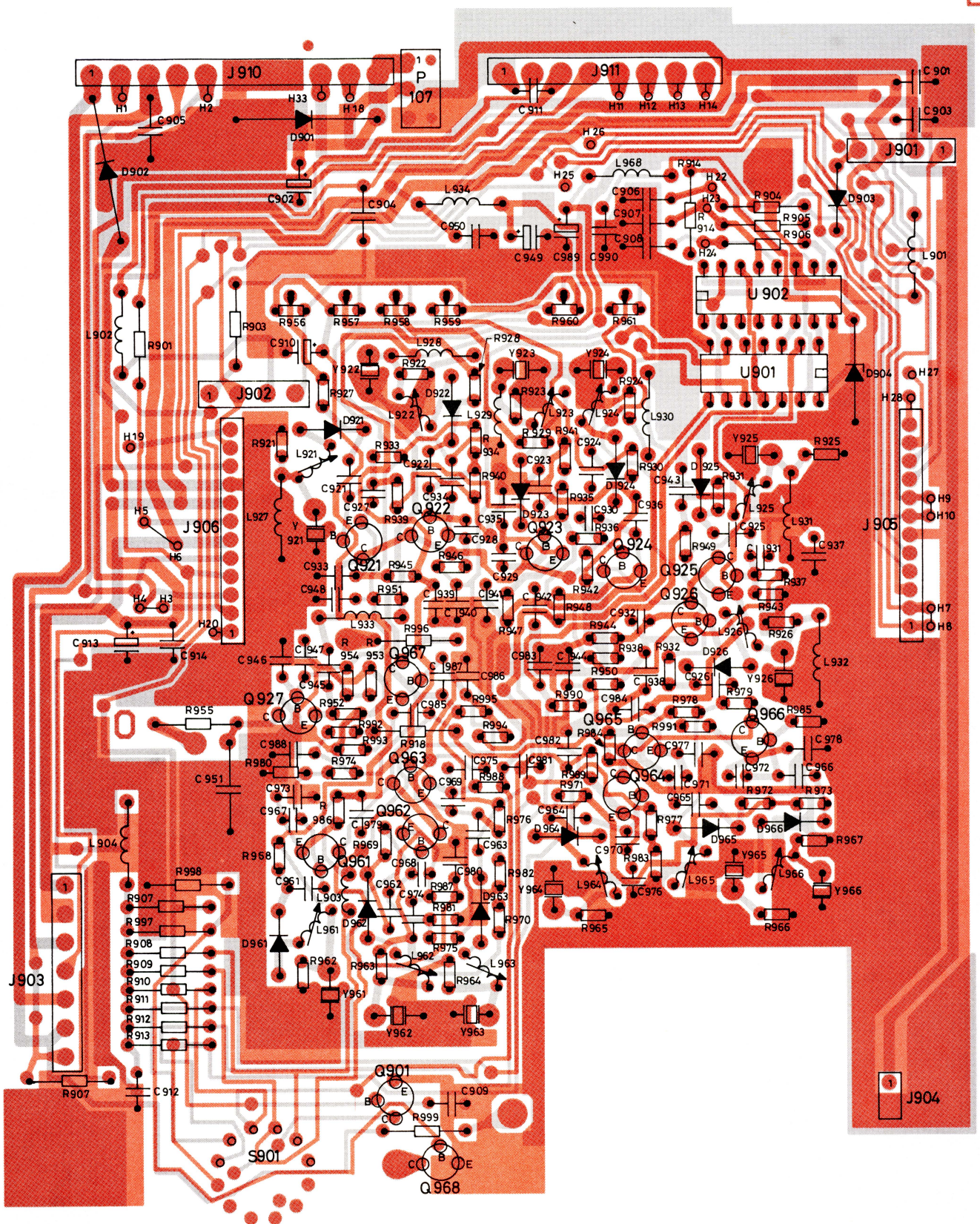
TS5012	T0	T1	T2	T3	T4	T5	T6	T7	T8
H4 - H22	*	*	*	*	*	*	*	*	*
H3 - H23	*	*	*	*	*	*	*	*	*
H2 - H24	*	*	*	*	*	*	*	*	*
H1 - H25	*	*	*	*	*	*	*	*	*
H0 - H4	*	*	*	*	*	*	*	*	*
H5 - H6	*	*	*	*	*	*	*	*	*
H7 - H8	*	*	*	*	*	*	*	*	*
H9 - H10	*	*	*	*	*	*	*	*	*
H20 - H20	*	*	*	*	*	*	*	*	*

CHANNEL SELECTOR UNIT
XS 5112



CHANNEL SELECTOR UNIT XS5112
INTERCONNECTION SECTION

D402.619/3



CHANNEL SELECTOR UNIT XS 5112
INTERCONNECTION SECTION

D402.619

TYPE	Nº	CODE	DATA
	C901	74. 5396	680pF 20% Ceram DI
	C902	73. 5165	220uF -10/+100% Elco
	C903	74. 5396	680pF 20% Ceram DI
	C904	74. 5141	22nF 5% Polyest FL
	C905	74. 5397	1nF 20% Ceram DI
	C906	74. 5397	1nF 20% Ceram DI
	C907	74. 5397	1nF 20% Ceram DI
	C908	74. 5397	1nF 20% Ceram DI
	C909	74. 5397	1nF 20% Ceram DI
	C910	73. 5173	10uF 20% Tantal
	C911	74. 5397	1nF 20% Ceram DI
	C912	74. 5395	470pF 5% Ceram DI
	C913	73. 5173	10 pF 20% Tantal
	C914	74. 5396	680 pF 20% Ceram DI
	C915	74. 5375	22 pF 5% Ceram DI
	C915	74. 5363	2.2 pF 0. 25 pF Ceram DI
	C916	74. 5377	33 pF 5% Ceram DI
	C916	74. 5377	33 pF 5% Ceram DI
	C917	74. 5391	100 pF 20% Ceram DI
	C918	74. 5391	100 pF 20% Ceram DI
	C921	74. 5405	180pF 5% Ceram DI
	C922	74. 5386	180pF 5% Ceram DI
	C923	74. 5386	180pF 5% Ceram DI
	C924	74. 5386	180pF 5% Ceram DI
	C925	74. 5386	180pF 5% Ceram DI
	C926	74. 5386	180pF 5% Ceram DI
	C927	74. 5403	18pF 5% Ceram DI
	C928	74. 5403	18pF 5% Ceram DI
	C929	74. 5403	18pF 5% Ceram DI
	C930	74. 5403	18pF 5% Ceram DI
	C931	74. 5403	18pF 5% Ceram DI
	C932	74. 5403	18pF 5% Ceram DI
	C933	74. 5405	68pF 5% Ceram DI
	C934	74. 5405	68pF 5% Ceram DI
	C935	74. 5405	68pF 5% Ceram DI
	C936	74. 5405	68pF 5% Ceram DI
	C937	74. 5405	68pF 5% Ceram DI
	C939	74. 5397	1nF 20% Ceram DI
	C940	74. 5397	1nF 20% Ceram DI
	C941	74. 5397	1nF 20% Ceram DI
	C942	74. 5397	1nF 20% Ceram DI
	C943	74. 5397	1nF 20% Ceram DI
	C944	74. 5397	1nF 20% Ceram DI
	C945	74. 5386	180pF 5% Ceram DI
	C946	74. 5397	1nF 20% Ceram DI
	C947	74. 5397	1nF 20% Ceram DI
	C948	74. 5396	680pF 20% Ceram DI
	C949	73. 5172	4. 7uF 20% Tantal

TYPE	Nº	CODE	DATA
	C950	76. 5135	10nF 10% Polyest FL
	C961	74. 5386	180pF 5% Ceram DI
	C962	74. 5386	180pF 5% Ceram DI
	C963	74. 5386	180pF 5% Ceram DI
	C964	74. 5386	180pF 5% Ceram DI
	C965	74. 5386	180pF 5% Ceram DI
	C966	74. 5386	180pF 5% Ceram DI
	C967	74. 5403	18pF 5% Ceram DI
	C968	74. 5403	18pF 5% Ceram DI
	C969	74. 5403	18pF 5% Ceram DI
	C970	74. 5403	18pF 5% Ceram DI
	C971	74. 5403	18pF 5% Ceram DI
	C972	74. 5403	18pF 5% Ceram DI
	C973	74. 5405	68pF 5% Ceram DI
	C974	74. 5405	68 pF 5% Ceram DI
	C975	74. 5405	68pF 5% Ceram DI
	C976	74. 5405	68pF 5% Ceram DI
	C977	74. 5405	68pF 5% Ceram DI
	C978	74. 5405	68pF 5% Ceram DI
	C979	74. 5397	1nF 20% Ceram DI
	C980	74. 5397	1nF 20% Ceram DI
	C981	74. 5397	1nF 20% Ceram DI
	C982	74. 5397	1nF 20% Ceram DI
	C983	74. 5397	1nF 20% Ceram DI
	C984	74. 5397	1nF 20% Ceram DI
	C985	74. 5386	180pF 5% Ceram DI
	C986	74. 5377	33 pF 5% Ceram DI
	C987	74. 5397	1nF 20% Ceram DI
	C988	74. 5396	680pF 20% Ceram DI
	C989	73. 5172	4. 7 20% Tantal
	C990	76. 5135	10nF 10% Polyest FL
	D901	99. 5520	1N5401 Diode
	D902	99. 5220	1N5401 Diode
	D903	99. 5237	1N4148 Diode
	D921	99. 5341	Varicap
	D922	99. 5341	Varicap
	D923	99. 5341	Varicap
	D924	99. 5341	Varicap
	D925	99. 5341	Varicap
	D926	99. 5341	Varicap
	D961	99. 5341	Varicap
	D962	99. 5341	Varicap

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TYPE	Nº	CODE	DATA
	D963	99.5341	Varicap
	D964	99.5341	Varicap
	D965	99.5341	Varicap
	J901	41.0228	Male connector
	J902	41.0228	Male connector
	J903	41.0229	Male connector
	J904	41.0225	Male connector
	J905	41.0227	Male connector
	J906	41.0227	Male connector
	J907	41.5545	Fem. connector
	J910	41.0232	Male connector
	J911	41.0231	Male connector
	L901	61.5029	1.0 uH RF choke
	L902	61.5029	1.0 uH RF choke
	L904	61.5029	1.0 uH RF choke
	L921	61.5032	48-58 MHz RF coil
	L922	61.5032	48-58 MHz RF coil
	L923	61.5032	48-58 MHz RF coil
	L924	61.5032	48-58 MHz RF coil
	L925	61.5032	48-58 MHz RF coil
	L926	61.5032	48-58 MHz RF coil
	L927	61.5030	1.5 uH RF choke
	L928	61.5030	1.5 uH RF choke
	L929	61.5030	1.5 uH RF choke
	L930	61.5030	1.5 uH RF choke
	L931	61.5030	1.5 uH RF choke
	L932	61.5030	1.5 uH RF choke
	L933	61.5029	1.0 uH RF choke
	L934	61.5031	10 uH RF choke
	L961	61.5034	45-55 MHz RF coil
	L962	61.5034	45-55 MHz RF coil
	L963	61.5034	45-55 MHz RF coil
	L964	61.5034	45-55 MHz RF coil
	L965	61.5034	45-55 MHz RF coil
	L966	61.5034	45-55 MHz RF coil
	L968	61.5031	10 uH RF choke
	P921	41.5550	Male connector
	P961	41.5550	Male connector
	Q901	99.5121	BC237 Transistor
	Q921	99.5294	PN2369 Transistor
	Q922	99.5294	PN2369 Transistor
	Q923	99.5294	PN2369 Transistor
	Q924	99.5294	PN2369 Transistor
	Q925	99.5294	PN2369 Transistor
	Q925	99.5294	PN2369 Transistor
	Q926	99.5294	PN2369 Transistor
	Q927	995294	PN2369 Transistor
	Q961	99.5294	PN2369 Transistor

TYPE	Nº	CODE	DATA
	Q962	99.5294	PN2369 Transistor
	Q963	99.5347	PN2369 Transistor
	Q964	99.5294	PN2369 Transistor
	Q965	99.5294	PN2369 Transistor
	Q966	99.5294	2N2369A Transistor
	Q966	99.5347	PN2369 Transistor
	Q967	99.5347	PN2369 Transistor
	Q968	99.5121	BC237 Transistor
	R901	80.5246	560 ohm 5% Carbon film
	R902	80.5249	1 Kohm 5% Carbon film
	R903	80.5266	27 Kohm 5% Carbon film
	R904	80.5261	10 Kohm 5% Carbon film
	R905	80.5261	10 Kohm 5% Carbon film
	R906	80.5261	10 Kohm 5% Carbon film
	R907	80.5261	10 Kohm 5% Carbon film
	R908	80.5261	10 Kohm 5% Carbon film
	R909	80.5261	10 Kohm 5% Carbon film
	R910	80.5261	10 Kohm 5% Carbon film
	R911	80.5261	10 Kohm 5% Carbon film
	R912	80.5261	10 Kohm 5% Carbon film
	R913	80.5261	10 Kohm 5% Carbon film
	R914	80.5242	270 ohm 5% Carbon film
	R918	80.8225	10 ohm 5% Carbon film
	R921	80.5247	680 ohm 5% Carbon film
	R922	80.5247	680 ohm 5% Carbon film
	R923	80.5247	680 ohm 5% Carbon film
	R924	80.5247	680 ohm 5% Carbon film
	R925	80.5247	680 ohm 5% Carbon film
	R926	80.5247	680 ohm 5% Carbon film
	R927	80.5269	47 Kohm 5% Carbon film
	R928	80.5269	47 Kohm 5% Carbon film
	R929	80.5269	47 Kohm 5% Carbon film
	R930	80.5269	47 Kohm 5% Carbon film
	R931	80.5269	47 Kohm 5% Carbon film
	R932	80.5269	47 Kohm 5% Carbon film
	R933	80.5261	10 Kohm 5% Carbon film
	R934	80.5261	10 Kohm 5% Carbon film
	R935	80.5261	10 Kohm 5% Carbon film
	R936	80.5261	10 Kohm 5% Carbon film
	R937	80.5261	10 Kohm 5% Carbon film
	R938	80.5261	10 Kohm 5% Carbon film
	R939	80.5260	8.2 Kohm 5% Carbon film

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TYPE	Nº	CODE	DATA
	R940	80.5260	8.2 Kohm 5% Carbon film
	R941	80.5260	8.2 Kohm 5% Carbon film
	R942	80.5260	8.2 Kohm 5% Carbon film
	R943	80.5260	8.2 Kohm 5% Carbon film
	R944	80.5260	8.2 Kohm 5% Carbon film
	R945	80.5242	270 ohm 5% Carbon film
	R946	80.5242	270 ohm 5% Carbon film
	R947	80.5242	270 ohm 5% Carbon film
	R948	80.5242	270 ohm 5% Carbon film
	R949	80.5242	270 ohm 5% Carbon film
	R950	80.5242	270 ohm 5% Carbon film
	R951	80.5237	100 ohm 5% Carbon film
	R952	80.5242	270 ohm 5% Carbon film
	R953	80.5255	3.3 Kohm 5% Carbon film
	R954	80.5259	6.8 Kohm 5% Carbon film
	R955	80.5235	68 ohm 5% Carbon film
	R956	86.5079	10 Kohm 10% Potentiometer
	R957	86.5079	10 Kohm 10% Potentiometer
	R958	86.5079	10 Kohm 10% Potentiometer
	R959	86.5079	10 Kohm 10% Potentiometer
	R960	86.5079	10 Kohm 10% Potentiometer
	R961	86.5079	10 Kohm 10% Potentiometer
	R962	80.5247	680 ohm 5% Carbon film
	R963	80.5247	680 ohm 5% Carbon film
	R964	80.5247	680 ohm 5% Carbon film
	R965	80.5247	680 ohm 5% Carbon film
	R966	80.5247	680 ohm 5% Carbon film
	R967	80.5247	680 ohm 5% Carbon film
	R968	80.5269	47 Kohm 5% Carbon film
	R969	80.5269	47 Kohm 5% Carbon film
	R970	80.5269	47 Kohm 5% Carbon film
	R971	80.5269	47 Kohm 5% Carbon film
	R972	80.5269	47 Kohm 5% Carbon film
	R973	80.5269	47 Kohm 5% Carbon film
	R974	80.5261	10 Kohm 5% Carbon film
	R975	80.5261	10 Kohm 5% Carbon film
	R976	80.5261	10 Kohm 5% Carbon film
	R977	80.5261	10 Kohm 5% Carbon film
	R978	80.5261	10 Kohm 5% Carbon film
	R979	80.5261	10 Kohm 5% Carbon film
	R980	80.5260	8.2 Kohm 5% Carbon film
	R981	80.5260	8.2 Kohm 5% Carbon film
	R982	80.5260	8.2 Kohm 5% Carbon film
	R983	80.5260	8.2 Kohm 5% Carbon film
	R984	80.5260	8.2 Kohm 5% Carbon film
	R985	80.5260	8.2 Kohm 5% Carbon film
	R986	80.5242	270 ohm 5% Carbon film
	R987	80.5242	270 ohm 5% Carbon film

TYPE	Nº	CODE	DATA
	R988	80.5242	270 ohm 5% Carbon film
	R989	80.5242	270 ohm 5% Carbon film
	R990	80.5242	270 ohm 5% Carbon film
	R991	80.5242	270 ohm 5% Carbon film
	R992	80.5237	100 ohm 5% Carbon film
	R993	80.5242	270 ohm 5% Carbon film
	R994	80.5255	3.3 Kohm 5% Carbon film
	R995	80.5259	6.8 Kohm 5% Carbon film
	R996	80.5229	22 ohm 5% Carbon film
	R997	80.5251	1.5 Kohm 5% Carbon film
	R998	80.5265	22 Kohm 5% Carbon film
	R999	80.5233	47 ohm 5% Carbon film
	S901	47.0643	Channel switch
	U901	14.5133	4028 BCD/DEC. decoder
	U902	14.5025	6405N Hex.inverter O.C

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NO	CODE	DATA
C901	74.5396	680pF 20% Ceram DI
C902	73.5165	220uF -10/+100% Elco
C903	74.5396	680pF 20% Ceram DI
C904	74.5141	22nF 5% Polyester FL
C905	74.5397	1nF 20% Ceram DI
C906	74.5397	1nF 20% Ceram DI
C907	74.5397	1nF 20% Ceram DI
C908	74.5397	1nF 20% Ceram DI
C909	74.5397	1nF 20% Ceram DI
C910	73.5173	10uF 20% Tantal
C911	74.5397	1nF 20% Ceram DI
C912	74.5395	470pF 5% Ceram DI
C913	73.5173	10 pF 20% Tantal
C914	74.5396	680 pF 20% Ceramic DI
C915	74.5375	22 pF 5% Ceramic DI
C916	74.5377	33 pF 5% Ceramic DI
C917	74.5391	100 pF 20% Ceramic DI
C918	74.5391	100 pF 20% Ceramic DI
C921	74.5405	180pF 5% Ceram DI
C922	74.5386	180pF 5% Ceram DI
C923	74.5386	180pF 5% Ceram DI
C924	74.5386	180pF 5% Ceram DI
C925	74.5386	180pF 5% Ceram DI
C926	74.5386	180pF 5% Ceram DI
C927	74.5403	18pF 5% Ceram DI
C928	74.5403	18pF 5% Ceram DI
C929	74.5403	18pF 5% Ceram DI
C930	74.5403	18pF 5% Ceram DI
C931	74.5403	18pF 5% Ceram DI
C932	74.5403	18pF 5% Ceram DI
C933	74.5405	68pF 5% Ceram DI
C934	74.5405	68pF 5% Ceram DI
C935	74.5405	68pF 5% Ceram DI
C936	74.5405	68pF 5% Ceram DI
C937	74.5405	68pF 5% Ceram DI
C938	J706256P205	68pF 5% CAP CER N1500
C939	74.5397	1nF 20% Ceram DI
C940	74.5397	1nF 20% Ceram DI
C941	74.5397	1nF 20% Ceram DI
C942	74.5397	1nF 20% Ceram DI
C943	74.5397	1nF 20% Ceram DI
C944	74.5397	1nF 20% Ceram DI

NO	CODE	DATA
C945	74.5386	180pF 5% Ceram DI
C946	74.5397	1nF 20% Ceram DI
C947	74.5397	1nF 20% Ceram DI
C948	74.5396	680pF 20% Ceram DI
C949	73.5172	4.7uF 20% Tantal
C950	76.5135	10nF 10% Polyester FL
C955	74.5395-00	470pF 5% CER
C956	74.5395-00	470pF 20% CER
C957	74.5395-00	470pF 20% CER
C958	74.5395-00	470pF 20% CER
C959	74.5395-00	470pF 20% CER
C960	74.5395-00	470pF 20% CER
C961	74.5386	180pF 5% Ceram DI
C962	74.5386	180pF 5% Ceram DI
C963	74.5386	180pF 5% Ceram DI
C964	74.5386	180pF 5% Ceram DI
C965	74.5386	180pF 5% Ceram DI
C966	74.5386	180pF 5% Ceram DI
C967	74.5403	18pF 5% Ceram DI
C968	74.5403	18pF 5% Ceram DI
C969	74.5403	18pF 5% Ceram DI
C970	74.5403	18pF 5% Ceram DI
C971	74.5403	18pF 5% Ceram DI
C972	74.5403	18pF 5% Ceram DI
C973	74.5405	68pF 5% Ceram DI
C974	74.5405	68 pF 5% Ceramic DI
C975	74.5405	68pF 5% Ceram DI
C976	74.5405	68pF 5% Ceram DI
C977	74.5405	68pF 5% Ceram DI
C978	74.5405	68pF 5% Ceram DI
C979	74.5397	1nF 20% Ceram DI
C980	74.5397	1nF 20% Ceram DI
C981	74.5397	1nF 20% Ceram DI
C982	74.5397	1nF 20% Ceram DI
C983	74.5397	1nF 20% Ceram DI
C984	74.5397	1nF 20% Ceram DI
C985	74.5386	180pF 5% Ceram DI
C986	A700233P7	1nF 20% CAP CER CL2
C987	74.5397	1nF 20% Ceram DI
C988	74.5396	680pF 20% Ceram DI
C989	73.5172	4.7u 20% Tantal
C990	74.5395	470pF 20% Ceran

CHANNEL SWITCH XS5112

X402.646/2

NO	CODE	DATA
C991	74.5361-00	1.5pF 0.25p CER
C992	A700235P18	27pF 5% CER
C993	A700233P6	680pF 20% CAP CER CL2
C994	74.5395-00	470pF 5% CER
C995	A700233P6	680pF 20% CAP CER CL2
C996	A700233P6	680pF 20% CAP CER CL2
C997	A700233P6	680pF 20% CAP CER CL2
C998	74.5395-00	470pF 5% CER
D901	99.5220	1N5401 Diode
D902	99.5220	1N5401 Diode
D903	99.5237	1N4148 Diode
D921	99.5341	Varicap
D922	99.5341	Varicap
D923	99.5341	Varicap
D924	99.5341	Varicap
D925	99.5341	Varicap
D926	99.5341	Varicap
D961	99.5341	Varicap
D962	99.5341	Varicap
D963	99.5341	Varicap
D964	99.5341	Varicap
D965	99.5341	Varicap
J901	41.0228	Male connector
J902	41.0228	Male connector
J903	41.0229	Male connector
J904	41.0225	Male connector
J905	41.0227	Male connector
J906	41.0227	Male connector
J907	41.5545	Fem. connector
J910	41.0232	Male connector
J911	41.0231	Male connector
L901	61.5029	1.0 uH RF choke
L902	61.5029	1.0 uH RF choke
L904	61.5029	1.0 uH RF choke
L921	61.5032	48-58 MHz RF coil
L922	61.5032	48-58 MHz RF coil
L923	61.5032	48-58 MHz RF coil
L924	61.5032	48-58 MHz RF coil
L925	61.5032	48-58 MHz RF coil
L926	61.5032	48-58 MHz RF coil
L927	61.5030	1.5 uH RF choke
L928	61.5030	1.5 uH RF choke

NO	CODE	DATA
L929	61.5030	1.5 uH RF choke
L930	61.5030	1.5 uH RF choke
L931	61.5030	1.5 uH RF choke
L932	61.5030	1.5 uH RF choke
L933	61.5029	1.0 uH RF choke
L934	61.5031	10 uH RF choke
L961	61.5034	45-55 MHz RF coil
L962	61.5034	45-55 MHz RF coil
L963	61.5034	45-55 MHz RF coil
L964	61.5034	45-55 MHz RF coil
L965	61.5034	45-55 MHz RF coil
L966	61.5034	45-55 MHz RF coil
L968	61.5031	10 uH RF choke
P921	41.5550	Male connector
P961	41.5550	Male connector
Q901	99.5121	BC237 Transistor
Q921	99.5294	PI2369 Transistor
Q922	99.5294	PI2369 Transistor
Q923	99.5294	PI2369 Transistor
Q924	99.5294	PI2369 Transistor
Q925	99.5294	PI2369 Transistor
Q926	99.5294	PI2369 Transistor
Q927	99.5294	PI2369 Transistor
Q961	99.5294	PI2369 Transistor
Q962	99.5294	PI2369 Transistor
Q963	99.5347	PI2369 Transistor
Q964	99.5294	PI2369 Transistor
Q965	99.5294	PI2369 Transistor
Q966	99.5294	2N2369A Transistor
Q967	99.5347	PI2369 Transistor
Q968	99.5121	BC237 Transistor
R904	80.5261	10 Kohm 5% Carbon film
R905	80.5261	10 Kohm 5% Carbon film
R906	80.5261	10 Kohm 5% Carbon film
R907	80.5261	10 Kohm 5% Carbon film
R908	80.5261	10 Kohm 5% Carbon film
R909	80.5261	10 Kohm 5% Carbon film
R910	80.5261	10 Kohm 5% Carbon film
R911	80.5261	10 Kohm 5% Carbon film
R912	80.5261	10 Kohm 5% Carbon film
R913	80.5261	10 Kohm 5% Carbon film
R914	80.5242	270 ohm 5% Carbon film

CHANNEL SWITCH XS5112

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N ^o	CODE	DATA
R918	80.8225	10 ohm 5% Carbon film
R921	A700019P30	270 ohm 5% Carbon film
R922	A700019P30	270 ohm 5% Carbon film
R923	A700019P30	270 ohm 5% Carbon film
R924	A700019P30	270 ohm 5% Carbon film
R925	A700019P30	270 ohm 5% Carbon film
R926	A700019P30	270 ohm 5% Carbon film
R927	80.5269	47 Kohm 5% Carbon film
R928	80.5269	47 Kohm 5% Carbon film
R929	80.5269	47 Kohm 5% Carbon film
R930	80.5269	47 Kohm 5% Carbon film
R931	80.5269	47 Kohm 5% Carbon film
R932	80.5269	47 Kohm 5% Carbon film
R933	A700019P47	6.8 Kohm 5% DEPC
R934	A700019P47	6.8 Kohm 5% DEPC
R935	A700019P47	6.8 Kohm 5% RES DEPC
R936	A700019P47	6.8 Kohm 5% RES DEPC
R937	A700019P47	6.8 Kohm 5% RES DEPC
R938	A700019P47	6.8 Kohm 5% RES DEPC
R939	A700019P46	5.6 Kohm 5% Carbon film
R940	A700019P46	5.6 Kohm 5% Carbon film
R941	A700019P46	5.6 Kohm 5% Carbon film
R942	A700019P46	5.6 Kohm 5% Carbon film
R943	A700019P46	5.6 Kohm 5% Carbon film
R944	A700019P46	5.6 Kohm 5% Carbon film
R945	80.5242	270 ohm 5% Carbon film
R946	80.5242	270 ohm 5% Carbon film
R947	80.5242	270 ohm 5% Carbon film
R948	80.5242	270 ohm 5% Carbon film
R949	80.5242	270 ohm 5% Carbon film
R950	80.5242	270 ohm 5% Carbon film
R951	80.5237	100 ohm 5% Carbon film
R952	80.5242	270 ohm 5% Carbon film
R953	80.5255	3.3 Kohm 5% Carbon film
R954	80.5259	6.8 Kohm 5% Carbon film
R955	A700019P20	39 ohm 5% RES DEPC
R956	86.5079	10 Kohm 10% Potentiometer
R957	86.5079	10 Kohm 10% Potentiometer
R958	86.5079	10 Kohm 10% Potentiometer
R959	86.5079	10 Kohm 10% Potentiometer
R960	86.5079	10 Kohm 10% Potentiometer
R961	86.5079	10 Kohm 10% Potentiometer

N ^o	CODE	DATA
R962	80.5247	680 ohm 5% Carbon film
R963	80.5247	680 ohm 5% Carbon film
R964	80.5247	680 ohm 5% Carbon film
R965	80.5247	680 ohm 5% Carbon film
R966	80.5247	680 ohm 5% Carbon film
R967	80.5247	680 ohm 5% Carbon film
R968	80.5269	47 Kohm 5% Carbon film
R969	80.5269	47 Kohm 5% Carbon film
R970	80.5269	47 Kohm 5% Carbon film
R971	80.5269	47 Kohm 5% Carbon film
R972	80.5269	47 Kohm 5% Carbon film
R973	80.5269	47 Kohm 5% Carbon film
R974	A700019P47	6.8 Kohm 5% Carbon film
R975	A700019P47	6.8 Kohm 5% Carbon film
R976	A700019P47	6.8 Kohm 5% Carbon film
R977	A700019P47	6.8 Kohm 5% Carbon film
R978	A700019P47	6.8 Kohm 5% Carbon film
R979	A700019P47	6.8 Kohm 5% Carbon film
R980	80.5260	8.2 Kohm 5% Carbon film
R981	80.5260	8.2 Kohm 5% Carbon film
R982	80.5260	8.2 Kohm 5% Carbon film
R983	80.5260	8.2 Kohm 5% Carbon film
R984	80.5260	8.2 Kohm 5% Carbon film
R985	80.5260	8.2 Kohm 5% Carbon film
R986	80.5242	270 ohm 5% Carbon film
R987	80.5242	270 ohm 5% Carbon film
R988	80.5242	270 ohm 5% Carbon film
R989	80.5242	270 ohm 5% Carbon film
R990	80.5242	270 ohm 5% Carbon film
R991	80.5242	270 ohm 5% Carbon film
R992	80.5237	100 ohm 5% Carbon film
R993	80.5242	270 ohm 5% Carbon film
R994	80.5255	3.3 Kohm 5% Carbon film
R995	80.5259	6.8 Kohm 5% Carbon film
R996	A700019P15	15 ohm 5% RES DEPC
R997	80.5251	1.5 Kohm 5% Carbon film
R998	80.5265	22 Kohm 5% Carbon film
R999	80.5233	47 ohm 5% Carbon film
S901	47.0643	Channel switch
U901	14.5133	4028 BCD/DEC. decoder
U902	14.5025	6405N Hex.inverter O.C

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NO	CODE	DATA
C612	74.5395	470pF 5% Ceram DI
C901	74.5396	680pF 20% Ceram DI
C902	74.5396	220uF -10/+100% Elco
C903	74.5396	680pF 20% Ceram DI
C904	74.5141	22nF 5% Polyester FL
C905	74.5397	1nF 20% Ceram DI
C906	74.5397	1nF 20% Ceram DI
C907	74.5397	1nF 20% Ceram DI
C909	74.5397	1nF 20% Ceram DI
C910	73.5173	10uF 20% Tantal
C911	74.5397	1nF 20% Ceram DI
C913	73.5173	10uF 20% Tantal
C914	74.5396	680pF 20% Ceram DI
C915	74.5375	22pF 5% Ceram DI
C917	74.5391	100 pF 20% Ceramic DI
C918	74.5391	100 pF 20% Ceramic DI
C921	74.5386	180pF 5% Ceram DI
C922	74.5386	180pF 5% Ceram DI
C927	74.5403	18pF 5% Ceram DI
C928	74.5403	18pF 5% Ceram DI
C933	74.5405	68pF 5% Ceram DI
C934	74.5405	68pF 5% Ceram DI
C939	74.5397	1nF 20% Ceram DI
C940	74.5397	1nF 20% Ceram DI
C945	74.5386	180pF 5% Ceram DI
C946	74.5397	1nF 20% Ceram DI
C947	74.5397	1nF 20% Ceram DI
C948	74.5396	680pF 20% Ceram DI
C949	73.5172	4.7uF 20% Tantal
C950	76.5135	10nF 10% Polyester FL
C951	74.5363	2.2 pF 0.25 pF Ceramic DI
C955	74.5395-00	470pF 5% CER
C960	74.5395-00	470pF 20% CER
C961	74.5386	180pF 5% Ceram DI
C962	74.5386	180pF 5% Ceram DI
C967	74.5403	18pF 5% Ceram DI
C968	74.5403	18pF 5% Ceram DI
C973	74.5405	68pF 5% Ceram DI
C974	74.5405	68 pF 5% Ceramic DI
C979	74.5397	1nF 20% Ceram DI
C980	74.5397	1 nF 20% Ceramic DI
C985	74.5386	180pF 5% Ceram DI

NO	CODE	DATA
C986	A700233P7	1nF 20% CAP CER CL2
C987	74.5397	1nF 20% Ceram DI
C988	74.5396	680pF 20% Ceram DI
C989	73.5172	4.7u 20% Tantal
C990	74.5395	470pF 20% Ceram
C991	74.5361-00	1.5pF 0.25p CER
C992	A700235P18	27pF 5% CER
C994	74.5395-00	470pF 5% CER
C998	74.5395-00	470pF 5% CER
D901	99.5220	1N5401 Diode
D902	99.5220	1N5401 Diode
D903	99.5237	1N4148 Diode
D921	99.5341	Varicap
D922	99.5341	Varicap
D961	99.5341	Varicap
D962	99.5341	Varicap
J901	41.0228	Male connector
J902	41.0228	Male connector
J903	41.0229	Male connector
J904	41.0225	Male connector
J905	41.0227	Male connector
J906	41.0227	Male connector
J907	41.5545	Fem. connector
J910	41.0232	Male connector
J911	41.0231	Male connector
L902	61.5029	1.0 uH RF choke
L904	61.5029	1.0 uH RF choke
L921	61.5032	48-58 MHz RF coil
L922	61.5032	48-58 MHz RF coil
L927	61.5030	1.5 uH RF choke
L928	61.5030	1.5 uH RF choke
L933	61.5029	1.0 uH RF choke
L934	61.5031	10 uH RF choke
L961	61.5034	45-55 MHz RF coil
L962	61.5034	45-55 MHz RF coil
L967	61.5029	1.0 uH RF choke
L968	61.5031	10 uH RF choke
P921	41.5550	Male connector
P961	41.5550	Male connector
Q901	99.5121	BC237 Transistor
Q921	99.5294	PN2369 Transistor
Q922	99.5294	PN2369 Transistor

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N ^o	CODE	DATA
Q927	99.5294	PN2369 Transistor
Q961	99.5294	PN2369 Transistor
Q962	99.5347	PN2369 Transistor
Q967	99.5347	PN2369 Transistor
Q968	99.5121	BC237 Transistor
R907	80.5261	10 Kohm 5% Carbon film
R908	80.5261	10 Kohm 5% Carbon film
R909	80.5261	10 Kohm 5% Carbon film
R918	80.8225	10 ohm 5% Carbon film
R921	A700019P30	270 ohm 5% Carbon film
R922	A700019P30	270 ohm 5% Carbon film
R927	80.5269	27 Kohm 5% Carbon film
R928	80.5269	47 Kohm 5% Carbon film
R933	A700019P47	6.8 Kohm 5% DEPC
R934	A700019P47	6.8 Kohm 5% DEPC
R939	A700019P46	5.6 Kohm 5% Carbon film
R940	A700019P46	5.6 Kohm 5% Carbon film
R945	80.5242	270 ohm 5% Carbon film
R946	80.5242	270 ohm 5% Carbon film
R951	80.5237	100 ohm 5% Carbon film
R952	80.5242	270 ohm 5% Carbon film
R953	80.5255	3.3 Kohm 5% Carbon film
R954	80.5259	6.8 Kohm 5% Carbon film
R955	A700019P20	39 ohm 5% RES DEPC
R956	86.5079	10 Kohm 10% Potentiometer
R957	86.5079	10 Kohm 10% Potentiometer
R962	80.5247	680 ohm 5% Carbon film
R963	80.5247	680 ohm 5% Carbon film
R968	80.5269	47 Kohm 5% Carbon film
R969	80.5269	47 Kohm 5% Carbon film
R974	A700019P47	6.8 Kohm 5% Carbon film
R975	A700019P47	6.8 Kohm 5% Carbon film
R980	80.5260	8.2 Kohm 5% Carbon film
R981	80.5260	8.2 Kohm 5% Carbon film
R986	80.5242	270 ohm 5% Carbon film
R987	80.5242	270 ohm 5% Carbon film
R992	80.5237	100 ohm 5% Carbon film
R993	80.5242	270 ohm 5% Carbon film
R994	80.5255	3.3 Kohm 5% Carbon film
R995	80.5259	6.8 Kohm 5% Carbon film
R996	A700019P15	15 ohm 5% RES DEPC
R997	80.5251	1.5 Kohm 5% Carbon film

N ^o	CODE	DATA
R998	80.5265	22 Kohm 5% Carbon film
R999	80.5233	47 ohm 5% Carbon film
S901	47.0643	Channel switch

CHANNEL SWITCH XS5111

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GENERAL DESCRIPTION

CQM5110 S12

The Stornophone 5000 is a mobile radiotelephone unit with self-contained controls and loudspeaker.

A comparison of the various models is presented in the table below.

Although compact in size, it contains a transmitter/receiver, optional 5-tone sequential encoder/decoder or Channel Guard, and up to 12 transmit and receive channels.

Type	CQM5112		CQM5113		CQM5114	
SPEC	6/10	25	6/10	25	6/10	25
Frequency Range MHz	146 - 174		146 - 174		146 - 174	
RF Power W	6/10	25	6/10	25	6/10	25
Channel Spacing kHz	30/25		20		12, 5	
Max. Number of Channels	12		12		12	

ACCESSORIES

STANDARD ACCESSORIES

Mounting frame

Power cable

Fist microphone with retainer or

Fixed - mount microphone

External loudspeaker

External switches

LS701 Loudspeaker enclosed in a plastic housing, complete with cable.

MC702b Dynamic fist microphone with adjustable output level.

JB701a Junction box for MC702b. Consists of a plastic housing provided with cable for soldering assembly. Junction box is to mounted behind the first microphone retainer.

MC703a Desk microphone with PTT (Push -to - Talk) switch for fixed installations.

MC704 Microphone with chockabsorbing mounting bracket for mobile installation.

MK704 Mounting kit consisting of 2 flexible tubes, used for mounting the MC704 in close-talk position.

MC5001

Fist microphone with retractable spiral cable for mobile installation.

HS5001

Retainer for MC5001

HS5002

Retainer, with switches, for MC5001

MC5002

Cylindrical handmicrophone with build-in amplifier and press-to talk switch. Fitted with a coiled cord terminated into a connector which fits into the microphone retainer.

HS5003

Retainer for MC5002, without hook switch.

HS5004

Retainer for MC5002, with hook switch.

MK5001

Installation kit containing connectors, power cable, fuses and fuseholders.

MN703

Desk stand for fixed installations.

MN704

Mounting bracket for the radio cabinet.

MN5001

Mounting frame for mobile installations allowing the radio to be fixed in 36 positions. Includes a base plate with locking screw.

MN5002

Mounting cassette for the radio cabinet (see mechanical layout).

MT5001

Microphone with retainer. The retainer contains a microswitch which is

used to switch off the internal loud-speaker, when the microphone is lifted.

- SU701 Transmitter keying switch for mounting on the steering column.
- SU702 Transmitter keying switch for mounting on the dashboard.
- SU704 Switch circuit for autoradio mounting.
- SU5003 External alarm with timer (Horn Alarm).

POWER SUPPLY UNITS:

Equipment	SUPPLY 220V AC	VOLTAGE +24V DC
CQM5000, max. 5 W	PS703	PS704
CQM5000, max. 20 W	PS5001	PS702

MECHANICAL AND ELECTRICAL DESCRIPTION

The internal construction of CQM5000 is on an H-frame chassis with a shelf separating the receiver/transmitter (RF) printed circuit board and the various option printed boards. Front panel controls are an integral part of the printed board assemblies.

The chassis is a die cast aluminium frame comprising the left and right sides, the back, and a shelf located midway between the top and bottom. The chassis front is open and looks like an "H" viewed from the front.

Interconnection to the package exterior and to internal options are made via the Frequency Synthesizer Board located on the option side of the H-frame. A test connector is also located on the synthesizer board and is accessible from the rear of the radio.

The moulded plastic front is directly attached to the chassis and has the speaker mounted to it. A separate moulded speaker grill and aluminum nameplate are attached to the front.

The top and bottom covers slide under the edge of the front and are then secured by screws at the rear.

The tone signalling encoder/decoder board (TQ), the Frequency Synthesizer Board (FS), and the Frequency Control (FC) mount in the top section of the chassis. Their switches and push buttons mount directly to the boards and protrude through the front. Thin casted shields with adjustment holes are placed over the transmitter and receiver oscillators and parts of the transmitter in order to reduce spurious radiation.

RECEIVER DESCRIPTION

The receiver circuitry is placed on the main board and can be divided into:

Receiver front end

1st IF section with first and second oscillator

455 kHz 2nd IF portion with demodulator.

(refer to functional block diagram)

FRONT-END

The receiver front-end consists of a dual-resonator input filter, a transistor RF amplifier, Q401, a triple-resonator intermediate filter and a FET mixer, Q402. The drain of the FET is terminated in the first IF resonant circuit which adapts the output impedance to the cry-

stal filter. The front-end, antenna relay, first mixer and part of the transmitter PA interconnections are designed in micro-stripline techniques on the mainboard.

1st IF

The first IF frequency is 10.7 MHz. The output from the crystal filter is fed to a dual-gate MOSFET amplifier, Q501, the output signal of which is fed to the second mixer, U501, a single balanced, self-oscillating, active mixer. Out of the second mixer comes the 455 kHz IF signal. Two diodes, D501-502, limit the output from the mixer.

Adjust the generator output to produce a deflection on the multimeter, i. e. a maximum reading of 50 μ A on the multimeter.

Adjust L401 and L402 for maximum deflection.

Detune L403 and 405 as much as possible.

Adjust L404 for maximum deflection on the multimeter. This is the only adjustment of L404 and it must not be touched during the rest of the procedure.

Adjust L403 and L405 for maximum deflection on the multimeter.

Readjust L401 and L402 for maximum deflection.

Remove the RF diode probe.

Standard Test condition:

Connect the RF generator to antenna connector and adjust the output to 1 mV e. m. f.

Modulate the RF generator with 1000 Hz to 60% of Δf max.

CQM5112 S12/S99 ± 3 kHz

CQM5113 S12/S99 ± 2.4 kHz

CQM5114 S12/S99 ± 1.5 kHz

Connect a 4 ohm/3 W resistor load to connector J910/37 (SPKR HI-SPKR LO).

Connect an AF voltmeter to J910/47 (FLTD VOL SPKR LO).

IF DEMODULATOR

Turn R521 halfway up.

Adjust L504 for maximum reading on the AF voltmeter.

Connect a distortion meter and AF voltmeter and Distortion meter across the 4 ohm resistor (if Storno E11c distortion meter is used switch the function to AF voltmeter).

Adjust the volume control for approx. 2 V across the load.

Adjust L501 and L406 for minimum distortion. The demodulated signal may be monitored on an oscilloscope connected in parallel with the distortion meter.

Connect the AF voltmeter and distortion meter to J910/47 (FLTD VOL - SPKR LO).

Adjust R521 for a reading of 275 mV on the AF voltmeter.

Requirement: 275 mV \pm 5 mV.

Read the distortion.

Typical Total Harmonic Distortion (THD) will be less than 5%.

RECEIVER SENSITIVITY

EIA or CEPT method may be used.

Method of measurement CEPT

The purpose of the measurement is to define the ratio of one condition to another.

The first condition is the one where a modulated RF-signal drives the receiver into full limiting.

The audio output is measured with the distortion meter (in the CAL position) and, disregarding the amplitude of the audio, this is adjusted to read 100% on the meter scale; this is our reference condition consisting of signal + noise + distortion, where 'signal' is the modulation of the RF, 'noise' is the lowest possible amount achieved from that particular receiver, when receiving a strong carrier, and 'distortion' is the modulation being slightly distorted in passing through the receiver.

The second condition is the one where the signal (modulation) is removed with a notch filter and the RF-signal is lowered in amplitude until the remaining noise and distortion increases to 20 dB below the first condition, as read on the distortion meter scale, This corresponds to a reading of 10%, 10 being 20 dB below 100, which was our reference condition.

In practice our first condition is achieved by feeding a minimum of 1000 μ V of RF signal modulated with 1000 Hz at 60% Δf max. to the receiver.

The audio output (which must be at least 100% of the receiver's audio rating) is measured through the psophometric filter, with the distort-

tion meter in position CAL and adjusted with potentiometer ADJ. FSD. to a reading of 100.

The notch filter is then inserted in series with the audio by pressing one of the buttons marked in $\%$. The meter needle immediately drops to indicate a low value, this being the receiver's inherent audio distortion.

By backing off the attenuator of the RF-generator thereby lowering the RF-input to the receiver, the noise will eventually increase; the attenuator is now adjusted for a 10% reading on the distortion meter scale.

At this stage it must be ensured that the increased noise and the signal (with the notch filter switched out while checking) still equals 100 on the meter scale.

The RF-generator's calibrated attenuator now shows the value of RF-signal required to achieve a 20 dB ratio between signal + noise + distortion and noise + distortion, i. e. 20 dB SINAD sensitivity.

EIA Method

EIA (Electronic Industrie's Association) Standard, definition:

The SINAD sensitivity of a receiver is the minimum input signal that will provide at least 50% of the receiver's rated audio power with 12 dB signal + noise + distortion to noise + distortion.

The EIA method differs from CEPT by omitting the psophometric filter, adjusting the RF generator for $2/3 \times \Delta f_{max}$, and measure at 50% of the receiver's rated AF power. The SINAD sensitivity is measured as a 12 dB ratio between signal + noise + distortion and noise + distortion, which corresponds to a reading of 25% noise + distortion.

ADJUSTING THE SENSITIVITY

Lower the RF generator output to obtain 20 dB SINAD (10% THD as measured with the distortion meter). Readjust L402 for the best SINAD value, e. i. lowest generator output for 25% THD.

MEASURING 20 dB SINAD (CEPT)

Adjust the volume control for 2.45 V as measured with an AF voltmeter across the load.

Adjust the RF generator output to obtain 20 dB SINAD condition.

Read the 20 dB SINAD sensitivity

Requirement: ≤ 0.75 uV (e. m. f.)

The sensitivity should be measured on all channels, if more than one.

MEASURING 12 dB SINAD (EIA)

Adjust the volume control for 2.45 V as measured with an AF voltmeter across the load. Adjust the RF generator to obtain 12 dB SINAD condition. Read the 12 dB SINAD sensitivity.

Requirement: ≤ 0.4 uV ($\frac{1}{2}$ e. m. f.)

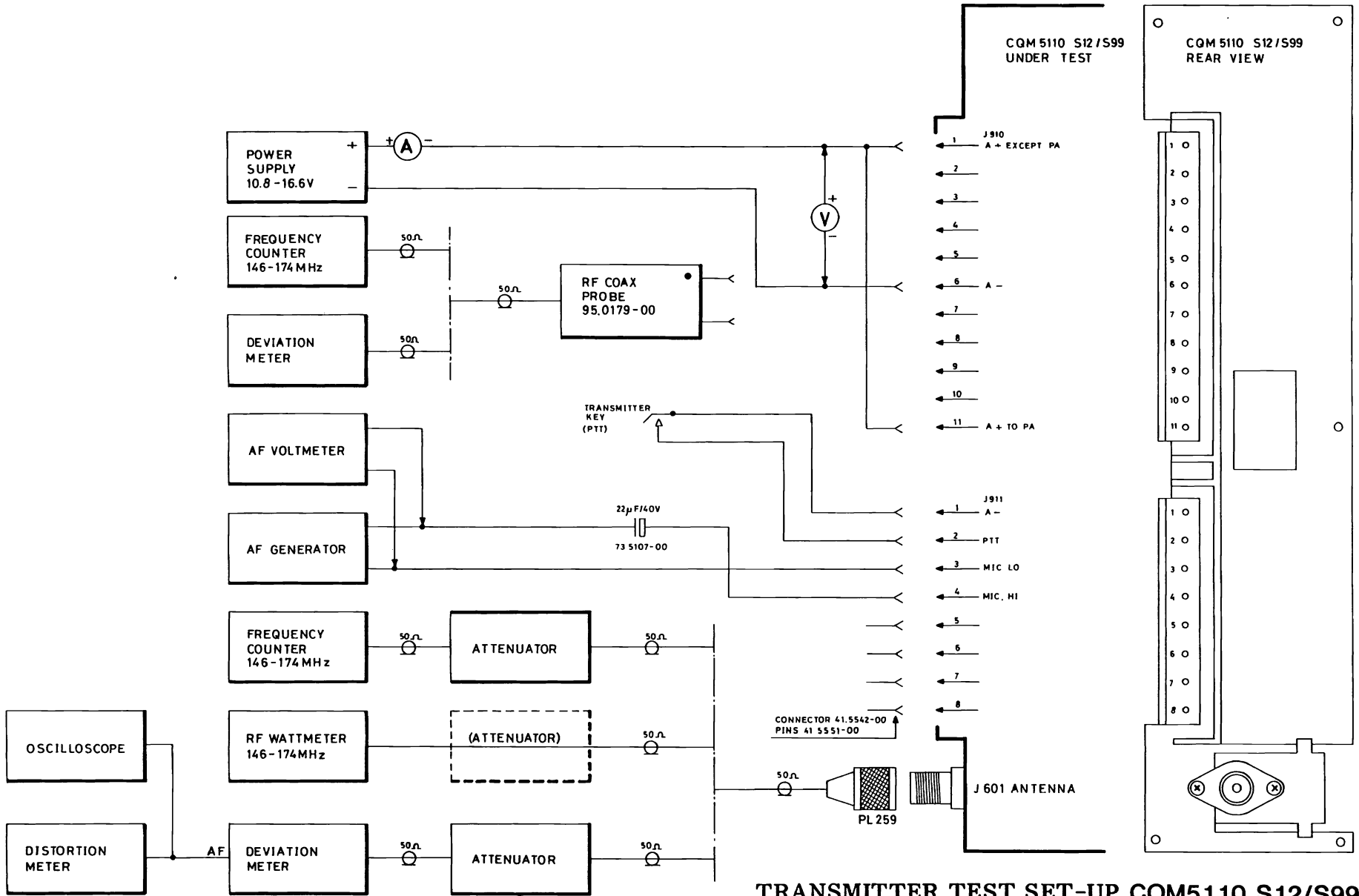
The sensitivity should be measured on all channels, if more than one.

AUDIO FREQUENCY RESPONSE

Set the signal generator to Standard Test Condition.

Adjust the volume control for 0.82 V across the load. (4 ohm across SPKR HI - LO).

At 13.2 V supply, $\Delta F = 60\% \Delta F_{max}$ and 1000 Hz measure the output voltage according to the following table:



TRANSMITTER TEST SET-UP CQM5110 S12/S99

D402.877/2

Stormo

ADJUSTMENT PROCEDURE

Stormo

NO	CODE	DATA
C701	A700233P5	470 pF Capacitor Ceramic
C702	J706005P3	47 uF Capacitor Electrolytic
C703	A700233P5	470 pF Capacitor Ceramic
C704	A700233P5	470 pF Capacitor Ceramic
C705	A700233P7	1 nF Capacitor Ceramic
C706	A701534P7	10 uF Capacitor Tantalum
C707	A700233P5	470 pF Capacitor Ceramic
C708	A700233P5	470 pF Capacitor Ceramic
C710	A701534P1	0.1 uF Capacitor tantal
C711	A700234P9	22 nF Capacitor Pol
C712	A701534P3	0.47 uF Capacitor Tantal
C713	A700235P28	180 pF Capacitor Ceramic
C714	J706256P202	18 pF 11500 Capacitor Ceramic
C715	J706256P205	68 pF 11500 Capacitor Ceramic
C716	A700233P5	470 pF Capacitor Ceramic
C717	A700235P19	33 pF Capacitor Ceramic
C718	A700235P7	3.3 pF Capacitor Ceramic
C719	A700235P16	18 pF Capacitor Ceramic
C720	A700233P7	1 nF Capacitor Ceramic
C721	A700235P7	3.3 pF Capacitor Ceramic
C722	A700235P19	33 pF Capacitor Ceramic
C723	A700235P18	27 pF Capacitor Ceramic
C724	A700233P5	470 pF Capacitor Ceramic
C725	J706256P202	18 pF 11500 Capacitor Ceramic
C726	J706256P205	68 pF 11500 Capacitor Ceramic
C727	A700235P28	180 pF Capacitor Ceramic
C728	A701534P7	10 uF Capacitor Tantalum
C729	A700233P5	470 pF Capacitor Ceramic
C730	A701534P6	4.7 uF Capacitor Tantalum
C731	A700233P2	150 pF Capacitor Ceramic
C732	A700235P7	3.3 pF Capacitor Ceramic
C733	A700013P8	0.39 pF Capacitor Phenolic
C734	A700233P5	470 pF Capacitor Ceramic
C735	A700233P7	1 nF Capacitor Ceramic
C737	J706003P1	1.8-10 pF Capacitor Variable
C738	A700235P13	10 pF Capacitor Ceramic
C739	A701534P4	1 uF Capacitor Tantalum
C740	A700235P23	68 pF Capacitor Ceramic
C741	A701534P7	10 uF Capacitor Tantalum
C742	A700235P7	3.3 pF Capacitor Ceramic
C743	A700233P5	470 pF Capacitor Ceramic
C744	A700235P5	2.2 pF Capacitor Ceramic

NO	CODE	DATA
C745	J706003P2	2-18 pF Capacitor Variable
C746	A700235P13	10 pF Capacitor Ceramic
C747	A701534P4	1 uF Capacitor Tantalum
C748	A700233P7	1 nF Capacitor Ceramic
C749	A700235P8	3.9 pF Capacitor Ceramic
C750	A700233P1	100 pF Capacitor Ceramic
C751	A701534P5	2.2 uF Capacitor Tantalum
C752	A700233P7	1 nF Capacitor Ceramic
C753	A700233P2	150 pF Capacitor Ceramic
C754	A700235P18	27 pF Capacitor Ceramic
C755	A701534P7	1 uF Capacitor Tantalum
C756	A701534P7	10 uF Capacitor Tantalum
C757	A700233P7	1 nF Capacitor Ceramic
C758	A700233P8	1.5 nF Capacitor Ceramic
C759	A701534P1	0.1 uF Capacitor Tantalum
C760	A701534P3	0.47 uF Capacitor Tantalum
C761	A700233P7	1 nF Capacitor Ceramic
C762	A700233P2	150 pF Capacitor Ceramic
C763	A700233P7	1 nF Capacitor Ceramic
C764	A700235P6	2.7 pF Capacitor Ceramic
C765	A700233P2	150 pF Capacitor Ceramic
C766	A700233P2	150 pF Capacitor Ceramic
C767	A700233P2	150 pF Capacitor Ceramic
C768	A700233P2	150 pF Capacitor Ceramic
C769	A700235P16	18 pF Capacitor Ceramic
C770	A700233P2	150 pF Capacitor Ceramic
C771	A700233P5	470 pF Capacitor Ceramic
C772	A700233P5	470 pF Capacitor Ceramic
C773	A700233P2	150 pF Capacitor Ceramic
C774	A700233P2	150 pF Capacitor Ceramic
C776	A700235P13	10 pF Capacitor Ceramic
C777	A700233P5	470 pF Capacitor Ceramic
C780	A700233P7	1 nF Capacitor Ceramic
C781	J706005P10	220 uF Capacitor Electrolytic
C782	A700233P7	1 nF Capacitor Ceramic
C783	A700235P19	33 pF Capacitor Ceramic
C784	A700233P7	1 nF Capacitor Ceramic
C785	A700233P7	1 nF Capacitor Ceramic
C791	J706261P1	22 nF Capacitor Polyester
C792	A700233P1	100 pF Capacitor Ceramic
C793	A700233P1	100 pF Capacitor Ceramic
D721	A700028P1	114148 Diode Silicon

FREQUENCY SYNTHESIZER FS5111

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NO	CODE	DATA
D722	A700028P1	11I4148 Diode Silicon
D723	A706262P1	Variable Cap. Diode
D724	J706262P1	Variable Cap. Diode
D725	A700073P1	BB409 Variable Cap. Diode
D726	A700073P1	BB409 Variable Cap. Diode
D727	A700073P1	BB409 Variable Cap. Diode
D733	J706006P2	BA282 Diode
D734	J706006P2	BA282 Diode
D741	J706026P1	11I5401 Diode Silicon
D742	J706026P1	11I5401 Diode Silicon
J730	J706215P108	Male Connector
J732	J706215P114	Male Connector
J901	J706214P4	Male Connector
J902	J706214P4	Male Connector
J903	J706214P7	Male Connector
J904	A700072P28	Male Connector
J905	A700072P9	Male Connector
J906	A700072P11	Male Connector
J907	A700102P10	Female Connector
J910	J706223P11	Male Connector
J911	J706223P8	Male Connector
J921	J706219P1	Male Connector
J961	J706219P1	Male Connector
L701	J706029P4	Variable Coil
L702	J708091P1	1.5 uH Coil
L703	A708091P1	1.5 uH Coil
L704	J706083P1	Variable Coil
L705	A700024P19	3.3 uH Coil
L706	A700024P19	3.3 uH Coil
L707	J706083P1	Variable Coil
L708	A700024P15	1.5 uH Coil
L711	J706029P4	Variable Coil
L712	A700024P19	3.3 uH Coil
L713	A700024P19	3.3 uH Coil
L714	J706258P1	Coil
L715	A700024P19	3.3 uH Coil
L716	A700024P19	3.3 uH Coil
L717	J706258P1	Coil
L718	A700024P19	3.3 uH Coil
L721	A700024P23	6.8 uH Coil
L722	A700024P3	0.15 uH Coil
L723	A700024P3	0.15 uH Coil

NO	CODE	DATA
Q702	A700020P1	BC558 Transistor
Q703	A700020P1	BC558 Transistor
Q704	A700020P1	BC558 Transistor
Q711	A707834P1	VM0610L Transistor
Q713	J706283P1	BFR54 Transistor
Q714	J706283P1	BFR54 Transistor
Q715	J706264P1	BF414 Transistor
Q716	J706038P1	2N5245 Transistor
Q717	J706038P1	2N5245 Transistor
Q722	J707515P1	BFX89 Transistor
Q723	J706264P1	BF414 Transistor
Q724	J707515P1	BFX89 Transistor
R704	A700019P34	560 ohm Resistor Depos.
R705	A700019P42	2.7 Kohm Resistor Depos.
R706	A700019P21	47 ohm Resistor Depos.
R707	A700019P49	10 Kohm Resistor Depos.
R708	A700019P49	10 Kohm Resistor Depos.
R709	A700019P42	2.7 Kohm Resistor Depos.
R711	A700019P42	2.7 Kohm Resistor Depos.
R712	A700019P49	10 Kohm Resistor Depos.
R713	A700019P17	22 ohm Resistor Depos.
R714	A700019P17	22 ohm Resistor Depos.
R720	A700019P49	10 Kohm Resistor Depos.
R721	A700019P45	4.7 Kohm Resistor Depos.
R722	A700019P60	82 Kohm Resistor Depos.
R723	A700019P60	82 Kohm Resistor Depos.
R724	A700019P61	100 Kohm Resistor Depos.
R725	A700019P57	47 Kohm Resistor Depos.
R726	A700019P49	10 Kohm Resistor Depos.
R727	A700019P30	270 ohm Resistor Depos.
R728	A700019P48	8.2 Kohm Resistor Depos.
R729	A700019P30	270 ohm Resistor Depos.
R730	A700019P45	4.7 Kohm Resistor Depos.
R731	A700019P30	270 ohm Resistor Depos.
R732	A700019P49	10 Kohm Resistor Depos.
R733	A700019P48	8.2 Kohm Resistor Depos.
R734	A700019P35	680 ohm Resistor Depos.
R735	A700029P57	47 Kohm Resistor Depos.
R736	A700029P31	330 ohm Resistor Depos.
R737	A700019P31	330 ohm Resistor Depos.
R738	A700019P25	100 ohm Resistor Depos.
R739	A700019P39	1.5 Kohm Resistor Depos.

FREQUENCY SYNTHESIZER FS5111

X402.895/2

Nº	CODE	DATA
R741	A700019P43	3.3 Kohm Resistor Depos.
R742	A700019P37	1 Kohm Resistor Depos.
R743	A700019P25	100 ohm Resistor Depos.
R748	A700019P27	150 ohm Resistor Depos.
R749	A700019P25	100 ohm Resistor Depos.
R750	A700019P57	47 Kohm Resistor Depos.
R752	A700016P3	4.7 Kohm Resistor Variable
R753	A700019P37	1 Kohm Resistor Depos.
R754	A700019P25	100 ohm Resistor Depos.
R761	A700019P13	10 ohm Resistor Depos.
R763	A700019P51	15 Kohm Resistor Depos.
R765	A700019P26	120 ohm Resistor Depos.
R769	A700019P36	820 ohm Resistor Depos.
R770	A700019P42	2.7 Kohm Resistor Depos.
R771	A700019P15	15 ohm Resistor Depos.
R772	A700019P57	47 Kohm Resistor Depos.
R773	A700019P55	33 Kohm Resistor Depos.
R774	A700019P50	12 Kohm Resistor Depos.
R775	A700019P33	470 ohm Resistor Depos.
R776	A700010P37	1 Kohm Resistor Depos.
R777	A700019P21	47 ohm Resistor Depos.
R778	A700019P25	100 ohm Resistor Depos.
R779	A700019P34	560 ohm Resistor Depos.
R780	A700019P23	68 ohm Resistor Depos.
R781	A700019P19	33 ohm Resistor Depos.
R782	A700019P44	3.9 Kohm Resistor Depos.
R783	A700019P27	150 ohm Resistor Depos.
R784	A700019P25	100 ohm Resistor Depos.
R785	A700019P39	1.5 Kohm Resistor Depos.
R786	A700019P31	330 ohm Resistor Depos.
R787	A700019P43	3.3 Kohm Resistor Depos.
R788	A700019P26	120 ohm Resistor Depos.
R789	A700019P34	560 ohm Resistor Depos.
R791	A700019P30	270 ohm Resistor Depos.
R792	A700019P38	1.2 Kohm Resistor Depos.
R793	A700019P17	22 ohm Resistor Depos.
R794	A700019P17	22 ohm Resistor Depos.
R798	A700019P37	1 Kohm Resistor Depos.
R799	A700019P54	27 Kohm Resistor Depos.
T701	J705284G1	Transformer
U701	J706263P1	MC145106
U702	J706238P1	TDA1062S IC

Nº	CODE	DATA
U703	A700029P44	4066B IC
W1	A700184P1	Jumper
W2	A700184P1	Jumper

FREQUENCY SYNTHESIZER FS5111

X402.895/2

N ^o	CODE	DATA
C701	A700233P5	470 pF Capacitor Ceramic
C702	J706005P3	47 uF Capacitor Electrolytic
C703	A700233P5	470 pF Capacitor Ceramic
C704	A700233P5	470 pF Capacitor Ceramic
C705	A700233P7	1 nF Capacitor Ceramic
C706	A701534P7	10 uF Capacitor Tantalum
C707	A700233P5	470 pF Capacitor Ceramic
C708	A700233P5	470 pF Capacitor Ceramic
C710	A701534P1	0.1 uF Capacitor tantal
C711	A700234P9	22 nF Capacitor Pol
C712	A701534P3	0.47 uF Capacitor Tantal
C713	A700235P28	180 pF Capacitor Ceramic
C714	J706256P202	18 pF N1500 Capacitor Ceramic
C715	J706256P205	68 pF N1500 Capacitor Ceramic
C716	A700233P5	470 pF Capacitor Ceramic
C717	A700235P19	3.3 pF Capacitor Ceramic
C718	A700235P7	3.3 pF Capacitor Ceramic
C719	A700235P16	18 pF Capacitor Ceramic
C720	A700233P7	1 nF Capacitor Ceramic
C721	A700235P7	3.3 pF Capacitor Ceramic
C722	A700235P19	33 pF Capacitor Ceramic
C723	A700235P18	27 pF Capacitor Ceramic
C724	A700233P5	470 pF Capacitor Ceramic
C725	J706256P202	18 pF N1500 Capacitor Ceramic
C726	J706256P205	68 pF N1500 Capacitor Ceramic
C727	A700235P28	180 pF Capacitor Ceramic
C728	A701534P7	10 uF Capacitor Tantalum
C729	A700233P5	470 pF Capacitor Ceramic
C730	A701534P6	4.7 uF Capacitor Tantalum
C731	A700233P2	150 pF Capacitor Ceramic
C732	A700235P7	3.3 pF Capacitor Ceramic
C733	A700013P8	0.39 pF Capacitor Phenolic
C734	A700233P5	470 pF Capacitor Ceramic
C735	A700233P7	1 nF Capacitor Ceramic
C737	J706003P1	1.8-10 pF Capacitor Variable
C738	A700235P13	10 pF Capacitor Ceramic
C739	A701534P4	1 uF Capacitor Tantalum
C740	A700235P23	68 pF Capacitor Ceramic
C741	A701534P7	10 uF Capacitor Tantalum
C742	A700235P7	3.3 pF Capacitor Ceramic
C743	A700233P5	470 pF Capacitor Ceramic
C744	A700235P5	2.2 pF Capacitor Ceramic

N ^o	CODE	DATA
C745	J706003P2	2-18 pF Capacitor Variable
C746	A700235P13	10 pF Capacitor Ceramic
C747	A701534P4	1 uF Capacitor Tantalum
C748	A700233P7	1 nF Capacitor Ceramic
C749	A700235P8	3.9 pF Capacitor Ceramic
C750	A700233P1	100 pF Capacitor Ceramic
C751	A701534P5	2.2 uF Capacitor Tantalum
C752	A700233P7	1 nF Capacitor Ceramic
C753	A700233P2	150 pF Capacitor Ceramic
C754	A700235P18	27 pF Capacitor Ceramic
C755	A701534P4	1 uF Capacitor Tantalum
C756	A701534P7	10 uF Capacitor Tantalum
C757	A700233P7	1 nF Capacitor Ceramic
C758	A700233P8	1.5 nF Capacitor Ceramic
C759	A701534P1	0.1 uF Capacitor Tantalum
C760	A701534P3	0.47 uF Capacitor Tantalum
C761	A700233P7	1 nF Capacitor Ceramic
C762	A700233P2	150 pF Capacitor Ceramic
C763	A700233P7	1 nF Capacitor Ceramic
C764	A700235P6	2.7 pF Capacitor Ceramic
C765	A700233P2	150 pF Capacitor Ceramic
C766	A700233P2	150 pF Capacitor Ceramic
C767	A700233P2	150 pF Capacitor Ceramic
C768	A700233P2	150 pF Capacitor Ceramic
C769	A700235P16	18 pF Capacitor Ceramic
C770	A700233P2	150 pF Capacitor Ceramic
C771	A700233P5	470 pF Capacitor Ceramic
C772	A700233P5	470 pF Capacitor Ceramic
C773	A700233P2	150 pF Capacitor Ceramic
C774	A700233P2	150 pF Capacitor Ceramic
C776	A700235P13	10 pF Capacitor Ceramic
C777	A700233P5	470 pF Capacitor Ceramic
C780	A700233P7	1 nF Capacitor Ceramic
C781	J706005P10	220 uF Capacitor Electrolytic
C782	A700233P7	1 nF Capacitor Ceramic
C783	A700235P19	33 pF Capacitor Ceramic
C784	A700233P7	1 nF Capacitor Ceramic
C785	A700233P7	1 nF Capacitor Ceramic
C791	J706261P1	22 nF Capacitor Polyester
C792	A700233P1	100 pF Capacitor Ceramic
C793	A700233P1	100 pF Capacitor Ceramic
D701	A700028P1	1N4148 Diode Silicon

FREQUENCY SYNTHESIZER FS5112

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N ^o	CODE	DATA
D702	A700028P1	1N4148 Diode Silicon
D703	A700028P1	1N4148 Diode Silicon
D704	A700028P1	1N4148 Diode Silicon
D705	A700028P1	1N4148 Diode Silicon
D706	A700028P1	1N4148 Diode Silicon
D707	A700028P1	1N4148 Diode Silicon
D708	A700028P1	1N4148 Diode Silicon
D709	A700028P1	1N4148 Diode Silicon
D710	A700028P1	1N4148 Diode Silicon
D711	A700028P1	1N4148 Diode Silicon
D712	A700028P1	1N4148 Diode Silicon
D713	A700028P1	1N4148 Diode Silicon
D714	A700028P1	1N4148 Diode Silicon
D721	A700028P1	1N4148 Diode Silicon
D722	A700028P1	1N4148 Diode Silicon
D723	A706262P1	Variable Cap. Diode
D724	J706262P1	Variable Cap. Diode
D725	A700073P1	BB409 Variable Cap. Diode
D726	A700073P1	BB409 Variable Cap. Diode
D727	A700073P1	BB409 Variable Cap. Diode
D733	J706006P2	BA282 Diode
D734	J706006P2	BA282 Diode
D741	J706026P1	1N5401 Diode Silicon
D742	J706026P1	1N5401 Diode Silicon
J730	J706215P108	Male Connector
J732	J706215P114	Male Connector
J901	J706214P4	Male Connector
J902	J706214P4	Male Connector
J903	J706214P7	Male Connector
J904	A700072P28	Male Connector
J905	A700072P9	Male Connector
J906	A700072P11	Male Connector
J907	A700102P10	Female Connector
J910	J706223P11	Male Connector
J911	J706223P8	Male Connector
J921	J706219P1	Variable Coil
J961	J706219P1	1.5 uH Coil
L701	J706029P4	1.5 uH Coil
L702	J708091P1	Variable Coil
L703	A708091P1	1.5 uH Coil
L704	J706083P1	Variable Coil
L705	A700024P19	3.3 uH Coil

N ^o	CODE	DATA
L706	A700024P19	3.3 uH Coil
L707	J706083P1	Variable Coil
L708	A700024P15	1.5 uH Coil
L711	J706029P4	Variable Coil
L712	A700024P19	3.3 uH Coil
L713	A700024P19	3.3 uH Coil
L714	J706258P1	Coil
L715	A700024P19	3.3 uH Coil
L716	A700024P19	3.3 uH Coil
L717	J706258P1	Coil
L718	A700024P19	3.3 uH Coil
L721	A700024P23	6.8 uH Coil
L722	A700024P3	0.15 uH Coil
L723	A700024P3	0.15 uH Coil
Q701	A700017P1	BC548 Transistor
Q702	A700020P1	BC558 Transistor
Q703	A700020P1	BC558 Transistor
Q704	A700020P1	BC558 Transistor
Q711	A707834P1	V10610L Transistor
Q713	J706283P1	BFR54 Transistor
Q714	J706283P1	BFR54 Transistor
Q715	J706264P1	BF414 Transistor
Q716	J706038P1	2N5245 Transistor
Q717	J706038P1	2N5245 Transistor
Q722	J707515P1	BFX89 Transistor
Q723	J706264P1	BF414 Transistor
Q724	J707515P1	BFX89 Transistor
R701	A700019P21	47 ohm Resistor Depos.
R702	A700019P39	1.5 Kohm Resistor Depos.
R703	A700019P53	22 Kohm Resistor Depos.
R704	A700019P34	560 ohm Resistor Depos.
R705	A700019P42	2.7 Kohm Resistor Depos.
R706	A700019P21	47 ohm Resistor Depos.
R707	A700019P49	10 Kohm Resistor Depos.
R708	A700019P49	10 Kohm Resistor Depos.
R709	A700019P42	2.7 Kohm Resistor Depos.
R711	A700019P42	2.7 Kohm Resistor Depos.
R712	A700019P49	10 Kohm Resistor Depos.
R713	A700019P17	22 ohm Resistor Depos.
R714	A700019P17	22 ohm Resistor Depos.
R720	A700019P49	10 Kohm Resistor Depos.
R721	A700019P45	4.7 Kohm Resistor Depos.

FREQUENCY SYNTHESIZER FS5112

X402.896/2

Nº	CODE	DATA
R722	A700019P60	82 Kohm Resistor Depos.
R723	A700019P60	82 Kohm Resistor Depos.
R724	A700019P61	100 Kohm Resistor Depos.
R725	A700019P57	47 Kohm Resistor Depos.
R726	A700019P49	10 Kohm Resistor Depos.
R727	A700019P30	270 ohm Resistor Depos.
R728	A700019P48	8.2 Kohm Resistor Depos.
R729	A700019P30	270 ohm Resistor Depos.
R730	A700019P45	4.7 Kohm Resistor Depos.
R731	A700019P30	270 ohm Resistor Depos.
R732	A700019P49	10 Kohm Resistor Depos.
R733	A700019P48	8.2 Kohm Resistor Depos.
R734	A700019P35	680 ohm Resistor Depos.
R735	A700029P57	47 Kohm Resistor Depos.
R736	A700029P31	330 ohm Resistor Depos.
R737	A700019P31	330 ohm Resistor Depos.
R738	A700019P25	100 ohm Resistor Depos.
R739	A700019P39	1.5 Kohm Resistor Depos.
R741	A700019P43	3.3 Kohm Resistor Depos.
R742	A700019P37	1 Kohm Resistor Depos.
R743	A700019P25	100 ohm Resistor Depos.
R748	A700019P27	150 ohm Resistor Depos.
R749	A700019P25	100 ohm Resistor Depos.
R750	A700019P57	47 Kohm Resistor Depos.
R752	A700016P3	4.7 Kohm Resistor Variable
R753	A700019P37	1 Kohm Resistor Depos.
R754	A700019P25	100 ohm Resistor Depos.
R761	A700019P13	10 ohm Resistor Depos.
R763	A700019P51	15 Kohm Resistor Depos.
R765	A700019P26	120 ohm Resistor Depos.
R769	A700019P36	820 ohm Resistor Depos.
R770	A700019P42	2.7 Kohm Resistor Depos.
R771	A700019P15	15 ohm Resistor Depos.
R772	A700019P57	47 Kohm Resistor Depos.
R773	A700019P55	33 Kohm Resistor Depos.
R774	A700019P50	12 Kohm Resistor Depos.
R775	A700019P33	470 ohm Resistor Depos.
R776	A700010P37	1 Kohm Resistor Depos.
R777	A700019P21	47 ohm Resistor Depos.
R778	A700019P25	100 ohm Resistor Depos.
R779	A700019P34	560 ohm Resistor Depos.
R780	A700019P23	68 ohm Resistor Depos.

Nº	CODE	DATA
R781	A700019P19	33 ohm Resistor Depos.
R782	A700019P44	3.9 Kohm Resistor Depos.
R783	A700019P27	150 ohm Resistor Depos.
R784	A700019P25	100 ohm Resistor Depos.
R785	A700019P39	1.5 Kohm Resistor Depos.
R786	A700019P31	330 ohm Resistor Depos.
R787	A700019P43	3.3 Kohm Resistor Depos.
R788	A700019P26	120 ohm Resistor Depos.
R789	A700019P34	560 ohm Resistor Depos.
R791	A700019P30	270 ohm Resistor Depos.
R792	A700019P38	1.2 Kohm Resistor Depos.
R793	A700019P17	22 ohm Resistor Depos.
R794	A700019P17	22 ohm Resistor Depos.
R798	A700019P37	1 Kohm Resistor Depos.
R799	A700019P54	27 Kohm Resistor Depos.
S901	J706322G1	Channel Switch
T701	J706284G1	Transformer
U701	J706263P1	MC145106
U702	J706238P1	TDA1062S IC
U703	A700029P44	4066B IC
V901	K805090G1	LMP
W1	A700184P1	Jumper
W2	A700184P1	Jumper

FREQUENCY SYNTHESIZER FS5112

X402. 896/2

STORNOPHONE 5000
Maintenance Manual
Section 4

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Service Coordination

TECHNICAL SPECIFICATIONS

CQM5330

Guaranteed performance specifications unless otherwise noted.

Typical values are given in parentheses.

GENERAL

Frequency Range

66 - 88MHz

Channel Separation

CQM5332: 30/25kHz

CQM5333: 25kHz

CQM5334: 12.5kHz

Maximum Frequency Deviation

CQM5332: ± 5 kHz

CQM5333: ± 4 kHz

CQM5334: ± 2.5 kHz

Modulation Frequency Range

CQM5332: 300 - 3000Hz

CQM5333: 300 - 3000Hz

CQM5334: 300 - 2700Hz

Maximum RF Bandwidth

Receiver: 1.5MHz

Transmitter: 2.5MHz

Antenna Impedance

50ohm

Maximum Number of Channels

6

Supply Voltage

Minimum: 10.8V

Nominal: 13.2V

Maximum: 16.6V

Temperature Range

-30°C to $+60^{\circ}\text{C}$

Dimensions

B x D x H: 180 x 190 x 60mm

Weight

1.8kg.

RECEIVER

Sensitivity

12dB SINAD (EIA), $\frac{1}{2}$ e. m. f.

0.3uV (0.25uV)

EIA measuring conditions:

$\Delta f = \pm 2/3 \times \Delta f \text{ max}$; $f_{\text{mod}} = 1\text{kHz}$

20dB SINAD (CEPT), e. m. f.

CQM5332: 0.75uV (0.55uV)

CQM5333: 0.75uV (0.55uV)

CQM5334: 1.0uV (0.75uV)

CEPT measuring conditions:

$\Delta f = 60\% \Delta f \text{ max}$; $f_{\text{mod}} = 1\text{kHz}$

Measured with psophometric filter.

Crystal Frequency Range

38.35 - 49.35

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s + 10.7}{2} \text{ MHz}$$

Frequency Stability

Conforms with government regulations

Modulation Acceptance Bandwidth (EIA)

CQM5332: ±7kHz (±7.5kHz)

6dB Bandwidth

CQM5333: ±5kHz (±5.8kHz)

Adjacent Channel Selectivity

EIA

CQM5332: 75dB (90dB)

FTZ

CQM5333: 70dB (88dB)

CEPT

CQM5332: 75dB (90dB)

CQM5334: 65dB (88dB)

Spurious Rejection

EIA

80dB (85dB)

Intermodulation Attenuation

EIA

CQM5332: 75dB (90dB)

FTZ

CQM5333: 70dB (90dB)

CEPT

CQM5332: 70dB (75dB)

CQM5333: 70dB (75dB)

CQM5334: 70dB (73dB)

Blocking

90dB/uV (104dB/uV)

Radiation

CQM5332: max. 0.8nW conducted

CQM5333: max. 0.8nW radiated

CQM5334: max. 0.8nW radiated

RF Load Impedance (Loudspeaker)

4ohm

AF Power Output

EIA: 3W (3.6W)

CEPT: 1.5W

AF Distortion

5% (1.5%)

Δf= 60% Δf max; 1kHz; 1W; RF 1mV

Audio Frequency Response

CQM5332: +1/-3dB (+0/-1.5dB)

CQM5333: +1/-3dB (+0/-1.5dB)

CQM5334: +1/-3dB (+0/-2.5dB)

relative to 1000Hz, -6dB octave

f_{mod}: 300 - 3000HzHum and Noise

Squelched: 80dB (better than 85dB)

Unsquelched: 55dB (60dB)

Squelch Attack Time

150ms (110ms)

Squelch Recovery Time

100ms (10ms)

Squelch Closing Time

150ms (20ms)

Current Consumption

Squelched: 150mA (130mA)

Receive, AF 2W: 500mA (450mA)

(1 channel, without tone equipment, 13.2V supply)

TRANSMITTER

RF Power Output

CQM5332-6: 6W

CQM5332-25: 25W

CQM5333-6: 6W

CQM5334-6: 6W

CQM5334-25: 25W

(R_L = 50ohm)Crystal Frequency Range

16.5 - 22MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s}{4}$$

Frequency Stability

Conforms with government regulation

Undesired Radiation

max. 0.2uW

Sideband Noise Power, CEPT

less than 70dB

Modulation AF Input Impedance

560ohm

Modulation Sensitivity

70mV ± 2dB

(60% Δf max., 1kHz)

Modulation Response

300 - 3000Hz

+1/-3dB (+0.5/-2dB)

relative to 1000Hz, 6dB/octave

400 - 2700Hz

+1/-1.5dB (+0.5/-1dB)

relative to 1000Hz, 6dB/octave

Modulation Distortion (CEPT)

max. 3%

f_{mod} = 1000Hz, Δf = ±1.5kHz

max. 5%

f_{mod} = 300Hz, Δf = ±0.9kHz

measured with 750u sec de-emphasis

FM Hum and Noise, CEPT

70dB

measured with 750u sec de-emphasis
and psophometric filterAttack Time

50ms

Current Consumption

6W: less than 3.5A (2.5A)

25W: less than 6.0A (5.0A)

GENERAL DESCRIPTION

CQM5330

The Stornophone 5000 is a mobile radiotelephone unit with self-contained controls and loudspeaker.

A comparison of the various models are presented in the table below.

Although compact in size, it contains a transmitter/receiver, optional 5-tone sequential encoder/decoder, or Channel Guard (Pilot tone), Group Call, All Call, and up to 6 transmit and receive channels.

Type	CQM5332		CQM5333		CQM5334	
SPEC	6	25	6	25	6/10	25
Frequency Range MHz	66 - 88		66 - 88		66 - 88	
RF Power W	6	25	6	25	6/10	25
Channel Spacing kHz	30/25		20		12.5	
Max. Number of Channels	6		6		6	

ACCESSORIES

Standard accessories include:

- Mounting frame
- Power cable
- Fist microphone with retainer or Fixed - mount microphone
- External loudspeaker
- External switches

MN5001

Mounting frame for mobile installations allowing the radio to be fixed in 36 positions. Includes a base plate with locking screw.

MN703

Desk stand for fixed installations.

MN704a

Mounting frame for mobile installations and direct attachment to the vehicle.

MC5001

Fist microphone with retractable spiral cable for mobile installation.

HS5001 Retainer for MC5001

HS5002 Retainer, with switches, for MC5001

MC704

Microphone with chockabsorbing mounting bracket for mobile installation.

MC703

Desk microphone with PTT switch for fixed installations.

MK5001

Installation kit containing connectors, power cable, fuses and fuseholders.

LS701

Loudspeaker enclosed in a plastic housing, complete with cable.

SU701

Transmitter keying switch for mounting on the steering coloum.

SU702

Transmitter keying switch for mounting on the dashboard.

Power Supply Units:		
Equipment	220V AC	+24V DC
CQM5000, max. 6/10W	PS703	PS704
CQM5000, max. 25W	PS5001	PS702

MECHANICAL AND ELECTRICAL DESCRIPTION

The internal construction of CQM5000 is on an H-frame chassis with a shelf separating the receiver/transmitter (RF) printed circuit board and the various option printed boards. Front panel controls are an integral part of the printed board assemblies.

The chassis is a die cast aluminium frame comprising the left and right sides, the back, and a shelf located midway between the top and bottom. The chassis front is open and looks like an "H" viewed from the front.

Interconnection to the package exterior and to internal options are made via a System Interconnect Board located on the option side of the H-frame. A test connector is also located on the system board and is accessible from the rear of the radio.

This board also serves as channel switch unit in sets with multichannel option.

The moulded plastic front is directly attached to the chassis and has the speaker mounted to it. A separate moulded speaker grill and aluminum nameplate are attached to the front.

The top and bottom covers slides under the edge of the front and are then secured by screws at the rear.

The tone signalling encoder/decoder board (TQ) and the multifrequency board (XS) mount in the top section of the chassis. Their switches and push buttons mount directly to the boards and protrude through the front.

Thin cast shields with adjustment holes are placed over the transmitter and receiver oscillators and parts of the transmitter in order to reduce spurious radiation.

CIRCUIT DESCRIPTION

(refer to functional block diagram)

Receiver

The receiver circuitry is placed on the main board and can be divided into:

- Receiver front end
- 1st IF section with first and second oscillator
- 455kHz 2nd IF portion with demodulator.

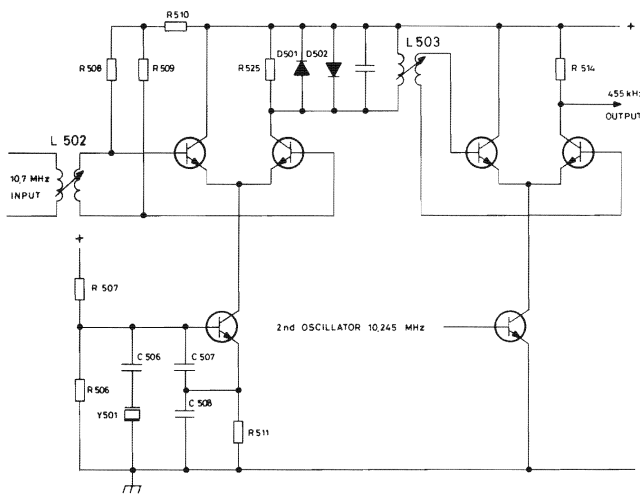
Front-End

The receiver front-end consists of a dual-resonator input filter, a transistor RF amplifier, Q401, a triple-resonator intermediate filter and a FET mixer, Q402. The drain of the FET is terminated in the first IF resonant circuit which adapts the output impedance to the crystal filter. The front-end, antenna

relay, first mixer and part of the transmitter PA interconnections are design in micro-strip-line techniques on the mainboard.

1st IF

The first IF frequency is 10.7MHz. The output from the crystal filter is fed to a dual-gate MOSFET amplifier, Q501, the output signal of which is fed to the second mixer, U501, a single balanced, self-oscillating, active mixer. Out of the second mixer comes the 455kHz IF signal. Two diodes, D501-502, limit the output from the mixer.



455kHz IF/Demodulator

The selectivity of the 455kHz IF amplifier is formed by a ceramic filter fed from a 455kHz amplifier/impedance transforming stage. The final 455kHz amplification and limiting is performed by an integrated circuit, U502, which also contains the quadrature FM detector and the AF amplifier/output emitter follower for the audio line signal.

SQUELCH AND AUDIO CIRCUITS

Squelch

The audio line signal (Vol/Sq - HI) is fed to a selective amplifier stage, where noise (frequencies around 7kHz) is extracted from the audio signal. Via the squelch potentiometer R607, this signal reaches an expander stage which improves the level discrimination characteristics of the circuit. A passive voltage doubler circuit (D603-D604) with high

source impedance performs the action of an average value rectifier. A Schmitt Trigger gives the necessary hysteresis and a well-defined output from the following buffer stage, Q605.

In the squelched condition and during transmissions this output is +1.5V and mutes the audio power amplifier.

The transmit indicator is part of the muting function.

A push button switch, S601, cancels the squelch function, when depressed, by grounding the base of Q601.

AUDIO

In sets with Pilot tone option, the audio line signal is fed to the Pilot tone board for filtering and back to the main board. In sets without Pilot tone this path is bypassed and the audio line signal is fed directly to the passive deemphasis network R629-C608 followed by the volume control. The volume control potentiometer R630 is mounted directly on the RF board and protrude through the front panel. The audio output amplifier U601 is a monolithic IC package capable of driving the loudspeaker at the desired power level. The output amplifier can be muted with a DC signal from the audio mute gate, which combines different logic signals to decide whether the amplifier should be active or not.

These inputs are:

- Regulated TX Voltage
- Squelch cancel
- Squelch signal

In sets equipped with Pilot tone and/or 5-tone sequential option, an RX mute function is routed from the option board to make the extra mute conditions possible. The value of C610 in the feed back loop is chosen as the best compromise between battery ripple rejection and receiver squelch attack time.

The pilot lamp in the channel knob is supplied from A+, but controlled by the regulated 8.5 V via transistor Q968.

TRANSMITTER

The transmitter consists of a modulation processor, an exciter, and a power amplifier, all assembled on the main board along with the receiver.

The exciter contains an FM oscillator, an audio processor, all frequency multiplier functions, and includes those stages operating at low enough power levels to avoid heat sinks. The exciter output is at the carrier frequency when applied to the power amplifier. The power amplifier boosts the signal to the proper level, and includes a low pass filter for suppressing harmonics and a circuitry which permits adjustment of the operating power level. The PA low pass filter connects to the antenna relay via a stripline on the board.

Modulation processor

The signal from the microphone load, R901 on the XS board, is applied to amplifier U101b. The transmitter audio frequency response is shaped by the feedback network R104-R103-C104. The modulation limiting is obtained in the feedback network formed by D101, D102, R105, R106 and R107. The maximum permissible frequency deviation is set by R116 in single channel sets. In multichannel sets the potentiometer is turned 2/3 up and the deviation adjusted individually; refer to XS5331 and XS5332.

Amplifier U101A is operated as an active low-pass splatter filter feeding the modulating input of the FM oscillator.

Exciter

The exciter takes the second harmonic of the crystal oscillator, filters it to reduce spurious signals and amplifies it. Three amplifier stages (Q201-2-3) and four filters (L201-2-4-5) are used in a narrow band design which limits the maximum frequency spread of the transmitter.

The exciter has two test points (TP201-2) for measurements and alignment.

Power Amplifier

The PA is constructed on the main board and employs two broadband untuned amplifier stages Q205, Q206. Two amplifier configurations are available providing options of power levels of 6 (10) watts or 25 watts. A power control circuit is included to sense the output RF level and keep it constant with variations in temperature and supply voltage. This circuit also limits the peak power to less than maximum, as specified by the authorities, while still maintaining the output as near maximum as possible. The output power level can be set with a potentiometer, R221, over at least a 3:1 range. The transmitter delivers rated power into a 50-ohm load. A load SWR of 1.4:1 will result in more than 90% of the power being radiated. The transmitter will operate into a load with up to 3:1 SWR.

The power adjustment is achieved by controlling the supply voltage of power amplifier Q205 via transistor Q207. This series transistor is biased by a voltage generated by the feedback network C240, D201, Q201, Q209, and Q208.

OSCILLATORS

The oscillators are located on the main board for single frequency radio sets. All parts for the oscillators and compensation network are soldered to the board except the crystal which is a plug-in type.

A multifrequency board is required for more than one frequency channel. This board is available in two versions; one (XS5331) has space for accommodating two transmit and two receive channels; one (XS5332) has space

for up to six channels and an option for selecting the channels by a 3-digit BCD signal binary converter, U901-U902. The BCD signal is applied to three pins in D911. Separate active circuitry is used for each oscillator and all have their outputs connected to two buffer amplifiers Q927-Q967. The buffers' outputs are fed to their resonant circuit on the main board by a plug-in connection (J301-J151). The required oscillator is selected by switching the emitter of the oscillator transistor to the negative DC supply. The compensation voltage and audio for the oscillators is obtained from the same circuit on the main board via J902.

The maximum transmitter frequency deviation for the system is set by adjusting potentiometers, one for each channel.

The oscillator uses a Colpitt's configuration with a bipolar transistor as the active element. The RX frequency is controlled by a third mode crystal which is operated at one half of the output frequency. The TX frequency is controlled by a fundamental mode crystal at one fourth of the output frequency. This output frequency is selected by a tuned circuit in the transistor collector circuit. To provide modulation and compensation capability, the crystal, a variable inductor, and a varicap (variable capacitance diode) are connected in series. The inductor provides adjustment of the frequency to set the oscillator to the channel frequency. The varicap permits electrical adjustment of the frequency. Compensation voltage is generated by a resistor - thermistor network and applied to the varicap. A resistor in parallel with the crystal prevents oscillations with the crystal removed from the circuit.

Transmitter Oscillator

In the transmitter circuit the audio voltage is superimposed on the compensating bias voltage to give the required deviation.

SUPPLY VOLTAGE DISTRIBUTION SYSTEM

The battery voltage (A + BATT) enters the radio via two pins of the rear system connector to the interconnect board. Both inputs are connected to reverse polarity protection diodes D901, D902. The ground lead comes through the same connector and is connected to chassis ground through a fusible printed wiring path which will open in case of the ground wire being accidentally connected to A +.

One battery input goes directly from the interconnect board via a feed-through capacitor and a connector P201 to the transmitter PA stages. The other input feeds through P903 to the main board for two functions. One branch for the audio amplifier passes through an RC-ripple filter R638 - C618 and one of the ON/OFF switch sections U602. The other section of the ON/OFF switch controls the V_B + to the voltage regulator S602 consisting of a monolithic regulator. The regulator output is fixed at 8.5V by means of a factory adjusted resistor.

Regulated 8.5V is switched to either the receiver or the transmitter by the antenna relay. The antenna relay is also supplied by the 8.5V regulated.

The squelch circuit, the modulation processor and parts of the IF amplifier U502 is supplied directly from the continuous 8.5V.

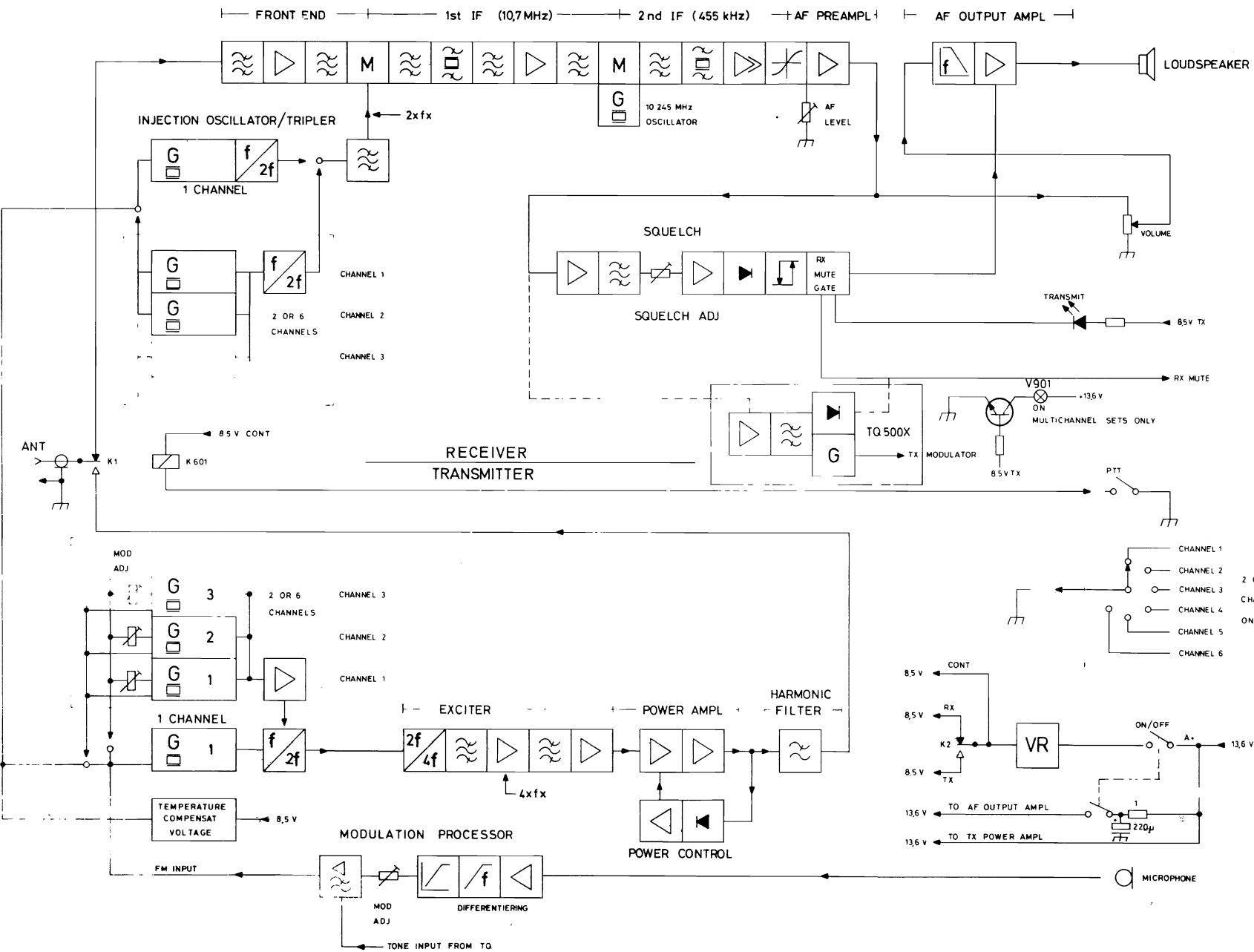
The receiver front-end, the receiver oscillator, the 10.7 MHz IF stages and the second oscillator are supplied from 8.5V RX. The transmitter oscillator and the exciter are supplied from 8.5V TX.

In sets with 5-tone sequential option or Pilot tone, the PTT (Push to talk) lead runs through the option board to provide for correct tone keying function.

WARNING

The transmitter PA transistors contain Beryllia which is poisonous when absorbed by the human body. Dissection, filing, or grinding of these transistor may be hazardous.

FUNCTIONAL BLOCK DIAGRAM
CAM 5330



ADJUSTMENT PROCEDURE

CQM5330

General

This adjustment procedure applies to the following radiotelephone types:

- CQM5332 - 30/25kHz Channel spacing
- CQM5333 - 20kHz Channel spacing
- CQM5334 - 12.5kHz Channel spacing

Before making adjustments to the radiotelephone transmitter/receiver, read the type label and note the channel frequencies.

Check all straps according to the notes on the diagrams. Also check the selective calling tone equipment, if any, against the coding instructions; refer to description of tone equipment.

All screens must be in place and properly secured during the adjustments.

Measuring Instruments

The following list contains instruments necessary for adjusting the radiotelephone and checking its performance characteristics:

DC Voltmeter	$R_{in} \geq 1\text{Mohm}$
AC Voltmeter	$Z_{in} > 1\text{Mohm} // 50\text{pF}$
Multimeter	$R_i \geq 20\text{Kohm/Volt}$
Distortion meter	e.g. Storno E11c
RF Watt meter	25W/50ohm/66-88MHz
RF generator	$Z_{out} = 50\text{ohm};$ 66-88MHz
10.7 MHz signal generator	e.g. Storno TS-G21B
Frequency counter with attenuator	$Z_{in} = 50\text{ohm};$ sensitivity 100mV at 88MHz
RF diode probe	Storno 95.0089-00
RF coaxial probe	Storno 95.0179-00
DC power supply	10.8V - 16.6V; 6A
Oscilloscope	0 - 5MHz min.
<u>Miscellaneous</u>	
40hm/3W resistor	3 x Storno code 82.5026-00
22uF/40V electrolytic capacitor	Storno code 73.5107-00
Connector, 11-pin house	Storno code 41.5543-00
Connector, 8-pin house	Storno code 41.5542-00
Pins for connectors	Storno code 41.5551-00

RECEIVER ADJUSTMENT

Checking 8.5V regulated supply

Turn the power supply ON and set the voltage to 13.2V. Set the power supply current limiter to 1A.

Turn the radiotelephone ON by depressing the ON/OFF button. Note the light in the Channel selector, if any, is on.

Depress the Squelch button.

Set the volume control to minimum.

Connect the DC voltmeter to J901 pin 3 and read the voltage.

Requirement: 8.5V \pm 0.15V

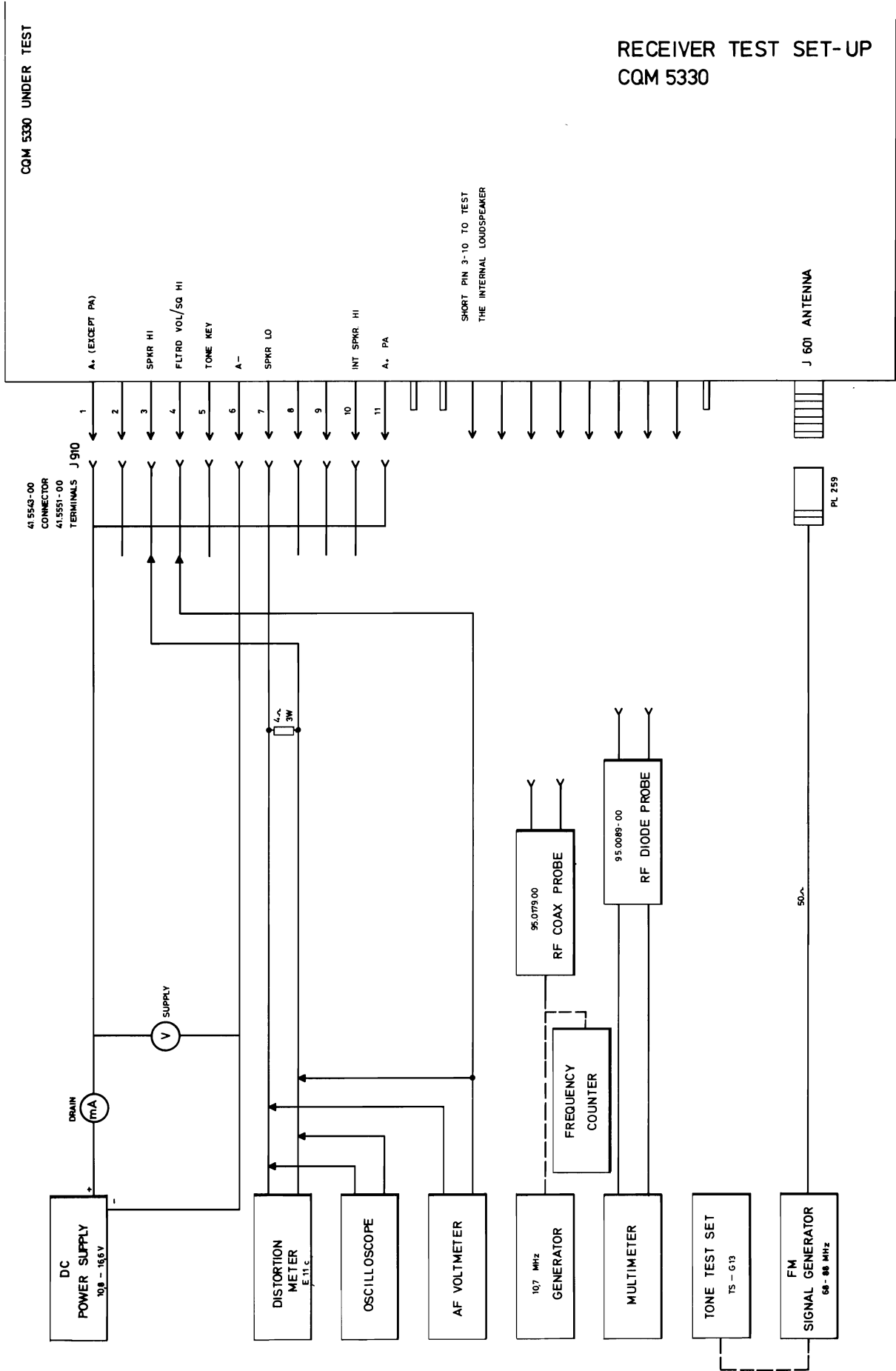
If the requirement is not fulfilled check resistor R636 against the colour code of U602.

U602 colour code	R636 Value
Brown	omit
Red	270
Orange	100
Yellow	47
Green	22
Blue	6.8

Adjust the power supply voltage to 16.6V and read the 8.5V regulated. Compare the change in the 8.5 volt regulated to the value obtained at 13.2V.

Requirement: $\leq 50\text{mV}$

Repeat the procedure with the power supply adjusted for 10.8V



Oscillator(s) and Frequency Multiplier

In single channel sets the receiver oscillator is located on the RF5330 board. In multichannel sets all oscillators are on the XS5331 board (2 Channels) or XS5332 (6 Channels).

Select the channel whose frequency is closest to center frequency. If not otherwise indicated adjustments should be performed on that channel.

Connect RF diode probe 95.0089-00 leads to the multimeter and select the most sensitive voltage range.

Connect the probe to TP401 with the dot to the live terminal.

Single channel sets

Adjust L301 for maximum deflection

Multichannel sets

Adjust the following coils for maximum deflection:

L961,	Channel 1
L962,	Channel 2
L963,	Channel 3
L964,	Channel 4
L965,	Channel 5
L966,	Channel 6

Adjust L303 and L305 for maximum deflection;
Typical 3 to 4 volts
Requirement: $\geq 3V$

Receiver frequency adjustment

Connect coax probe 95.0179-00 to testpoint TP401.

Connect the frequency counter to the probe, and read the frequency. The frequency is measured after the doubler and shall be $F_{\text{antenna}} + 10,7\text{MHz}$

Single channel sets

Adjust L301 for the specified frequency ($2xf_x$)

This adjustment shall be performed at 25°C
Requirement: $F_{\text{nom}} \pm 0.4\text{ppm}$ ($\pm 30\text{Hz}$ at 75MHz)

Multichannel sets

Adjust the following coils on the XS board to the specified receiver frequencies ($2xf_x$)

L961,	Channel 1
L962,	Channel 2
L963,	Channel 3
L964,	Channel 4
L965,	Channel 5
L966,	Channel 6

Requirement: $F_{\text{nom}} \pm 0.4\text{ppm}$ ($\pm 30\text{Hz}$ at 75MHz)
 $\text{ppm} = \text{parts per million} = \times 10^{-6}$

IF Amplifiers

Connect a 10.7MHz signal generator to TP401 via coax probe 95.0179-00.

Connect RF diode probe 95.0089-00 with multimeter to test point TP501. (50uA range). During adjustment the RF generator output must be kept low enough to prevent limiting in the IF stages, i.e. a maximum reading of 50uA on the multimeter.

Adjust coils L503, L502, L501, and L406, in that order, for maximum deflection on the multimeter.

Front-end

Connect the RF probe 95.0089-00 and the multimeter to test point TP501. (50uA range). Connect an unmodulated RF generator to the antenna connector, J601.

Set the generator frequency to the receiver frequency.

Adjust the generator output to produce a deflection on the multimeter, i.e. a maximum reading of 50uA on the multimeter.

Adjust L401 and L402 for maximum deflection. Detune L403 and 405 as much as possible.

Adjust L404 for maximum deflection on the multimeter. This is the only adjustment of L404 and it must not be touched during the rest of the procedure.

Adjust L403 and L405 for maximum deflection on the multimeter.

Readjust L401 and L402 for maximum deflection.

Remove the RF diode probe.

Standard Test condition:

Connect the RF generator to antenna connector and adjust the output to 1mV e. m. f. Modulate the RF generator with 1000Hz to 60% of ΔF max.

CQM5332 = ± 3 kHz

CQM5333 = ± 2.4 kHz

CQM5334 = ± 1.5 kHz

IF demodulator

Connect a 4ohm/3W resistor load to connector J910/3-7 (SPKR HI - SPKR LO).

Connect an AF voltmeter to J910/4-7 (FLTD VOL - SPKR LO).

Turn R521 halfway up.

Adjust L504 for maximum reading on the AF voltmeter.

Connect a distortion meter and AF voltmeter across the 4 ohm resistor. (if Storno E11c distortion meter is used switch the function to AF voltmeter).

Adjust the volume control for approx. 2V across the load.

Adjust L501 and L406 for minimum distortion. The demodulated signal may be monitored on an oscilloscope connected in parallel with the distortion meter.

Connect the AF voltmeter and distortion meter to J910/4-7 (FLTD VOL - SPKR LO).

Adjust R521 for a reading of 275mV on the AF voltmeter.

Requirement: 275mV \pm 5mV.

Read the distortion.

Typical Total Harmonic Distortion (THD) will be less than 5%.

Receiver Sensitivity, SINAD

EIA or CEPT method may be used.

Receiver sensitivity measurement EIA.

EIA (Electronic Industrie's Association) Standard, definition:

The SINAD sensitivity of a receiver is the minimum input signal that will provide at least 50% of the receivers's rated audio power with 12dB signal +noise +distortion to noise + distortion.

Method of measurement. CEPT

The purpose of the measurement is to define the ratio of one condition to another.

The first condition is the one where a modulated RF-signal drives the receiver into full limiting. The audio output is measured with the distortion meter (in the CAL position) and, disregarding the amplitude of the audio, this is adjusted to read 100% on the meter scale; this is our reference condition consisting of signal +noise +distortion, where 'signal' is the modulation of the RF, 'noise' is the lowest possible amount achieved from that particular receiver, when receiving a strong carrier, and 'distortion' is the modulation being slightly distorted in passing through the receiver.

The second condition is the one where the signal (modulation) is removed with a notch filter and the RF-signal is lowered in amplitude until the remaining noise and distortion increases to 20dB below the first condition, as read on the distortion meter scale. This corresponds to a reading of 10%, 10 being 20dB below 100, which was our reference condition.

In practice our first condition is achieved by feeding a minimum of 1000uV of RF-signal modulated with 1000Hz at 60% Δf max. to the receiver.

The audio output (which must be at least 100% of the receiver's audio rating) is measured through the psophometric filter, with the distortion meter in position CAL and adjusted with potentiometer ADJ. FSD. to a reading of 100.

The notch filter is then inserted in series with the audio by pressing one of the buttons marked in %. The meter needle immediately drops to indicate a low value, this being the receiver's inherent audio distortion.

By backing off the attenuator of the RF-generator thereby lowering the RF input to the receiver, the noise will eventually increase; the attenuator is now adjusted for a 10% reading on the distortion meter scale.

At this stage it must be ensured that the increased noise and the signal (with the notch filter switched out while checking) still equals 100 on the meter scale.

The RF-generator's calibrated attenuator now shows the value of RF-signal required to achieve a 20dB ratio between signal + noise + distortion and noise + distortion, i. e. 20dB SINAD sensitivity.

EIA Method

The EIA method differs from CEPT by omitting the psophometric filter, adjusting the RF generator for $2/3 \times \Delta f_{max}$, and measure the distortion at 50% of the receiver's rated AF power. The SINAD sensitivity is measured as a 12dB ratio between signal + noise + distortion and noise + distortion, which corresponds to a reading of 25% noise + distortion.

Adjusting the sensitivity

Lower the RF generator output to obtain 20dB SINAD (10% THD as measured with the distortion meter). Readjust L402 for the best SINAD value, e. i. lowest generator output for 10% THD.

Measuring 20 dB SINAD (CEPT)

Adjust the volume control for 2.45V (1.5W/4ohm) as measured with an AF voltmeter across the load.

Adjust the RF generator output to obtain 20dB SINAD condition.

Read the 20dB SINAD sensitivity (e. m. f.)

Requirement: $\leq 0.75\mu V$.

The sensitivity should be measured on all channels, if more than one.

Measuring 12dB SINAD (EIA)

Adjust the volume control for 2.45V as measured with an AF voltmeter across the load.

Adjust the RF generator to obtain 12dB SINAD condition.

Read the 12dB SINAD sensitivity.

Requirement: $\leq 0.3\mu V$ ($\frac{1}{2}$ e. m. f.)

The sensitivity should be measured on all channels, if more than one.

Audio Frequency Response

Set the signal generator to Standard Test Condition.

Adjust the volume control for 0.82V across the load. (4ohm across (SPKR HI - LO).

At 13.2V supply, $\Delta F = 60\%$ ΔF_{max} and 1000Hz measure the output voltage according to the following table:

	Frequency	Level	Tol.
Type CQM5332	300Hz	+9dB	+1dB/-3dB
Type CQM5334	1000Hz	0dB	
	3000Hz	-9.5dB	+1dB/-3dB
Type CQM5333	300Hz	+10.5dB	+1.5dB/-3dB
	400Hz	+8dB	+1.5dB/-1.5dB
	1000Hz	0dB	
	2700Hz	-8.6dB	+1.5dB/-1.5dB
	3000Hz	-9.5dB	+1.5dB/-3dB
	6000Hz	<-20dB	

AF Power Output

Adjust the RF signal generator to Standard Test Condition.

Set the supply voltage to 13.2V.

Adjust the volume control for 3W output (3.46V across the 4ohm load).

Measure the distortion (THD).

Requirement: THD \leq 5%.

Squelch

Release the squelch cancel button.

Adjust potentiometer R607 squelch adj. to open the receiver for an RF input signal corresponding to 8-10dB SINAD.

Current consumption

Measure the current consumption at 13.2V.

Requirements

Condition	1 channel	2 channels	6 channels
Standby	\leq 150mA	\leq 160mA	\leq 200mA
Receive 2W AF ~ 2.83V r. m. s. across 4ohm.	\leq 500mA	\leq 510mA	\leq 550mA

For sets with selective calling facilities add current consumption of the tone unit to the figures above.

TRANSMITTER ADJUSTMENTS

Adjust the power supply voltage to 13.2V and set current limiter as follows:

25W transmitter: 6A

6W transmitter: 4A

Refer to Receiver Alignment for measuring 8.5V regulated supply.

Preset all transmitter tuning slugs, L151, L153, L201, L202, L204, and L205 to be flush with the coil form top.

Connect a multimeter (2.5 volt range) to test point TP201.

Turn the power control potentiometer, R221, to minimum, anticlockwise (CCW).

Connect a Wattmeter, (25W) to the antenna connector, J601.

Oscillator adjustment

In single channel sets the transmitter oscillator is located on the RF5330 board. In multichannel sets all oscillators are on the XS5331 board (2 channels) or XS5332 (6 channels). Select the channel whose frequency is closest to the center frequency. If not otherwise indicated adjustments should be performed on that channel.

Key the Transmitter.

Single channel sets

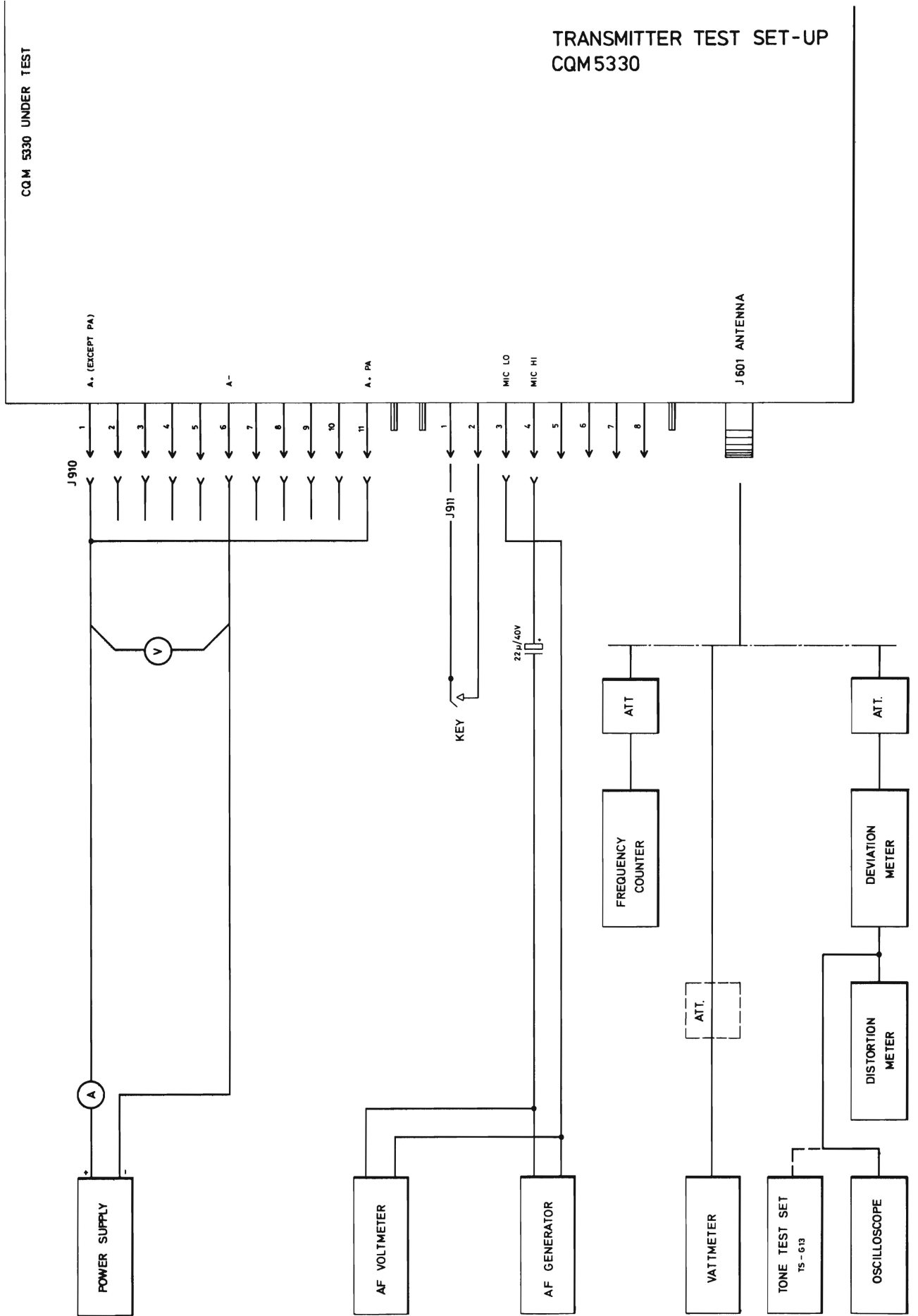
Adjust L153 for maximum deflection on the multimeter. The increase deflection is small and gently tuning is required. If the frequency is in the low end of the band it may be necessary to turn the slug of L151 (L921 - L926) partly into the coil form to obtain a multimeter deflection.

Adjust L151 for maximum meter reading, typical 1.2V.

Multichannel sets

Adjust the following coils for maximum deflection on the multimeter, typical 1.2V.

- L921, channel 1
- L922, channel 2
- L923, channel 3
- L924, channel 4
- L925, channel 5
- L926, channel 6



Exciter, coarse adjustment

Connect a multimeter (2.5V range) to test point TP201.
 Adjust L153 for maximum deflection.
 Adjust L201 for minimum deflection. The dip is small
 Connect the multimeter (2.5V range) to test point TP202.
 Adjust L202 for maximum deflection on the multimeter, typical 1.0V.
 Adjust L204 for minimum reading. The dip is small.
 Connect diode probe 95.0089-00 and the multimeter (25V range) to test point TP203.
 Adjust L204 and L205 for maximum reading on the multimeter, typical 15V.
 Adjust the PA power control, R221, for rated transmitter power, 6/10W or 25W.

Exciter, fine adjustment

Connect the multimeter to test point TP201.
 Readjust L153 for maximum reading.
 Connect the multimeter to test point TP202.
 Peak L201 and L202 for maximum reading.
 If the maximum is not well defined detune L153 slightly, adjust L201 and L202, and repeat the adjustment of L153.
 Connect the 95.0089-00 RF probe and multimeter to test point TP203.
 Peak L204 and L205 for maximum reading.

Transmitter frequency adjustment

Connect a frequency counter through a suitable attenuator to the antenna connector J601.

Single channel sets

Adjust L151 to specified transmitter frequency.

Multichannel sets

Adjust the following coils on the XS board to the specified transmitter frequencies:

- L921, channel 1
- L922, channel 2
- L923, channel 3
- L924, channel 4
- L925, channel 5
- L926, channel 6

The frequency adjustment shall be performed at 25°C.

Requirement: $F_{nom} \pm 0.4\text{ppm}$.

RF power output, current consumption, and power control

Connect the Watt meter to the antenna connector, J601.

Increase the supply voltage to 16V. The voltage is measured directly at the input connector J910.

Readjust the PA power control, R221, for rated transmitter power (P), 6(10) or 25W.

Requirement: $P_{nom} \pm 0.1\text{dB}$.

Measure the RF power output at 16V, 13.2V and 10.8V.

Requirements (25W):

Voltage	Power	Current
16.6V	25W (ref)	$\leq 5.8\text{A}$
13.2V	$\geq 23.5\text{W}$	$\leq 5.8\text{A}$
10.8V	$\geq 20\text{W}$	$\leq 5.8\text{A}$

Requirements (6W):

Voltage	Power	Current
16V	6W (ref)	$\leq 2.6\text{A}$
13.2V	$\geq 5.2\text{W}$	$\leq 2.6\text{A}$
10.8V	$\geq 5.0\text{W}$	$\leq 2.6\text{A}$

MODULATION ADJUSTMENT

Set the power supply voltage to 13. 2V.

Connect a deviation meter through an attenuator to the antenna connector, J601.

Connect a distortion meter and oscilloscope to the deviation meter output.

Connect a AF generator and an AF voltmeter to the microphone input via a 22uF capacitor; refer to test setup.

Adjust the AF generator output to 1V r. m. s. This voltage is approx. 20dB above the nominal modulation input level (60% Δf max) to ensure full limiting in the modulation processor.

Find the AF frequency between 200Hz and 3000Hz giving the greatest frequency deviation as read on the deviation meter with the transmitter keyed.

Check the maximum deviation for both positive and negative deviation polarity. At that audio frequency set the maximum frequency deviation Δf max with R116.

Type	Channel spacing	Δf max
CQM5332	30/25kHz	± 5 kHz
CQM5333	20kHz	± 4 kHz
CQM5334	12. 5kHz	$\pm 2. 5$ kHz

Requirement

Difference between + and - deviation: $\leq 10\%$

Multichannel sets

In multichannel sets R116 is turned 2/3 clockwise and the modulation adjustment is adjusted individually for each channel using the Δf max potentiometers on the XS board.

R956	= channel 1
R957	= channel 2
R958	= channel 3
R959	= channel 4
R960	= channel 5
R961	= channel 6

Modulation sensitivity and modulation distortion

Set the AF generator frequency to 1000Hz

Adjust the generator output until 60% of Δf max is obtained on the deviation meter.

CQM5332 : $\pm 3. 0$ kHz

CQM5333 : $\pm 2. 4$ kHz

CQM5334 : $\pm 1. 5$ kHz

Read the AF generator output and measure the modulation distortion on the audio output of the deviation meter.

Requirements:

Modulating signal: 75mV ± 2 dB

Distortion: $\leq 7\%$

(measured without deemphasis)

Modulation frequency response

Set the AF generator to 1000Hz.

Reduce the AF generator output until a deviation of $0. 2 \times \Delta f$ max is obtained on the deviation meter.

CQM5332 : $\pm 1. 0$ kHz

CQM5333 : $\pm 0. 8$ kHz

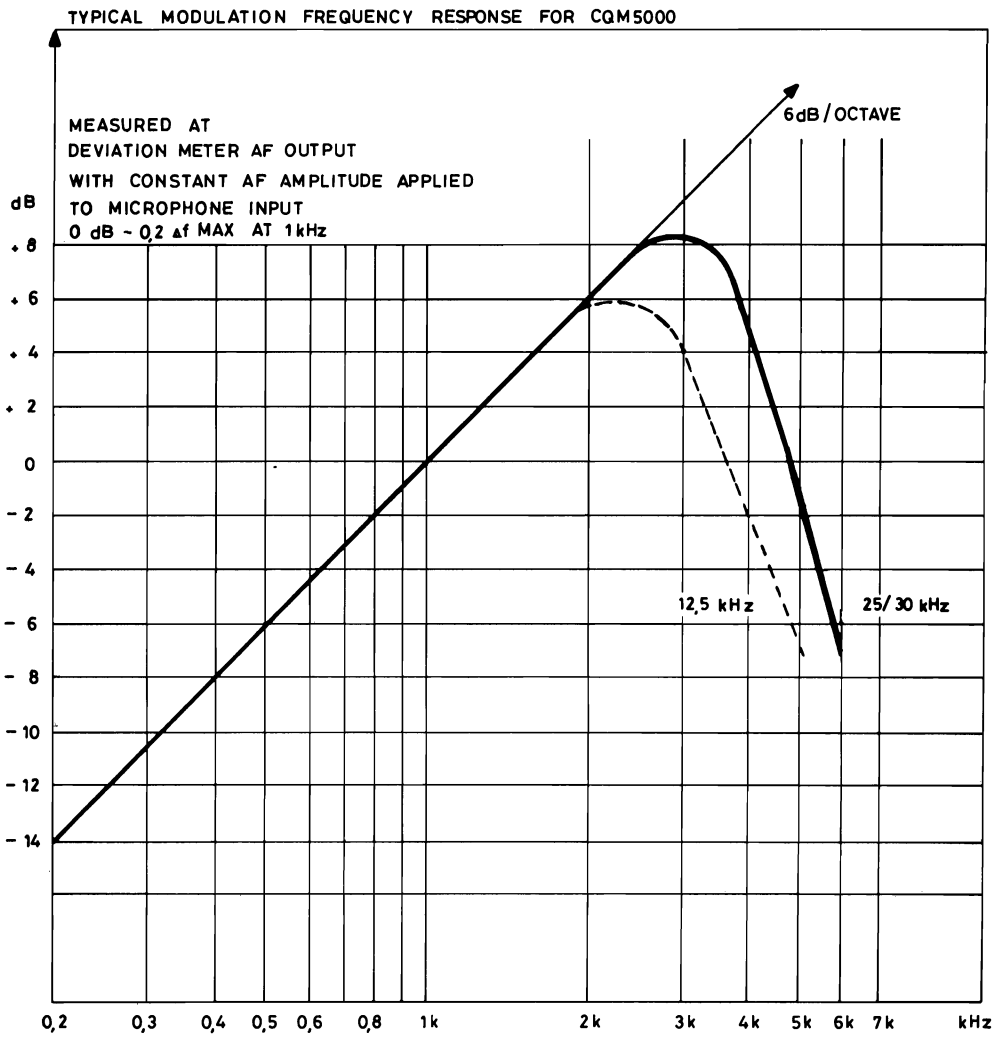
CQM5334 : $\pm 0. 5$ kHz

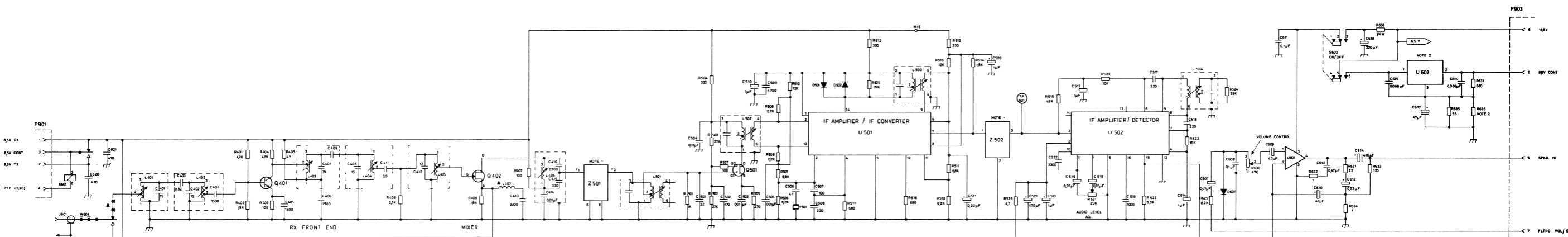
Vary the frequency of the generator and note the deviation changes as referred to the 1000Hz value.

Requirement :

Within the frequency range 400-2700Hz the frequency characteristic shall lie within +1dB/-1. 5dB related to a 6dB/octave characteristic.

With 6kHz modulation frequency the deviation shall be attenuated at least 6dB below the 1kHz value.





NOTE 1
Z501 AND Z502 ARE NOT INCLUDED
IN 15, 8384-00 AND
15, 8385-00

NOTE 2
VALUE OF R438 DEPENDS
ON COLOUR MARK ON U602

U602
GROUP VALUE
BROWN (NO R636)
RED 270
ORANGE 100
YELLOW 47
GREEN 22
BLUE 8.2

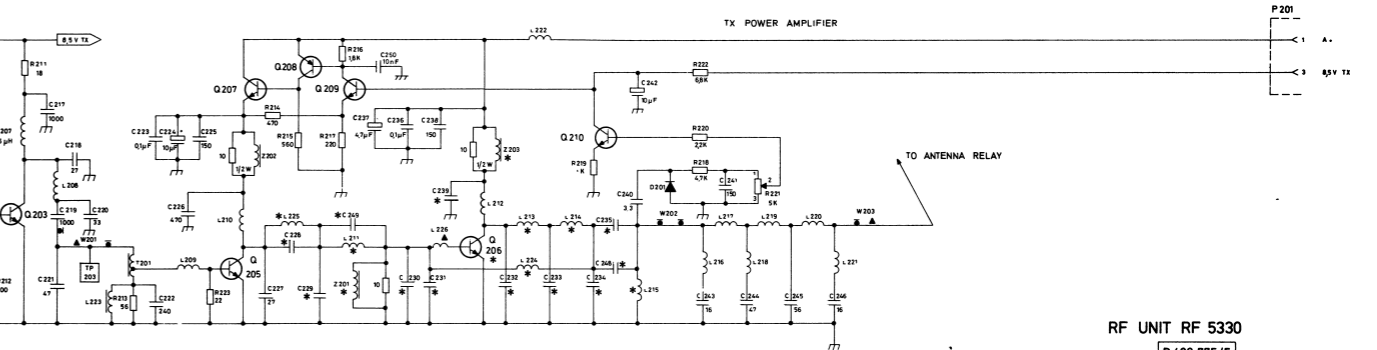
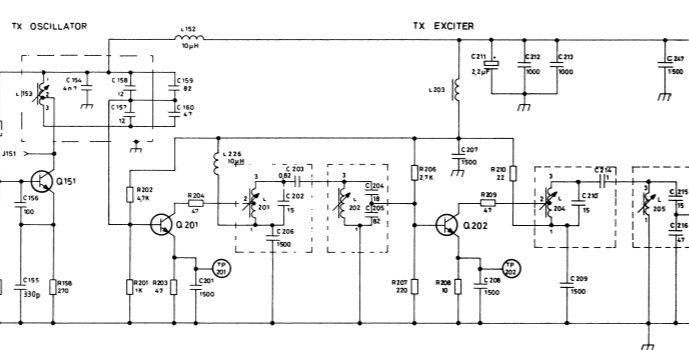
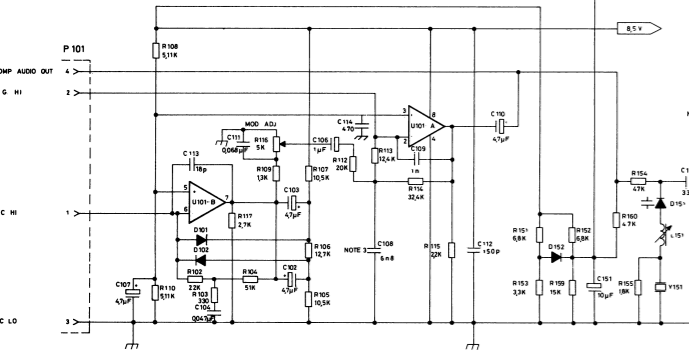
NOTE 3
RF3332 FOR SWEDEN R109-1,8K
RF3334 R109-1,8K C108-100n

NOTE 4
TO MODIFY FOR MULTIFREQUENCY REMOVE
R157 TO DISABLE TX OSCILLATOR AND/OR
R399 TO DISABLE RX OSCILLATOR

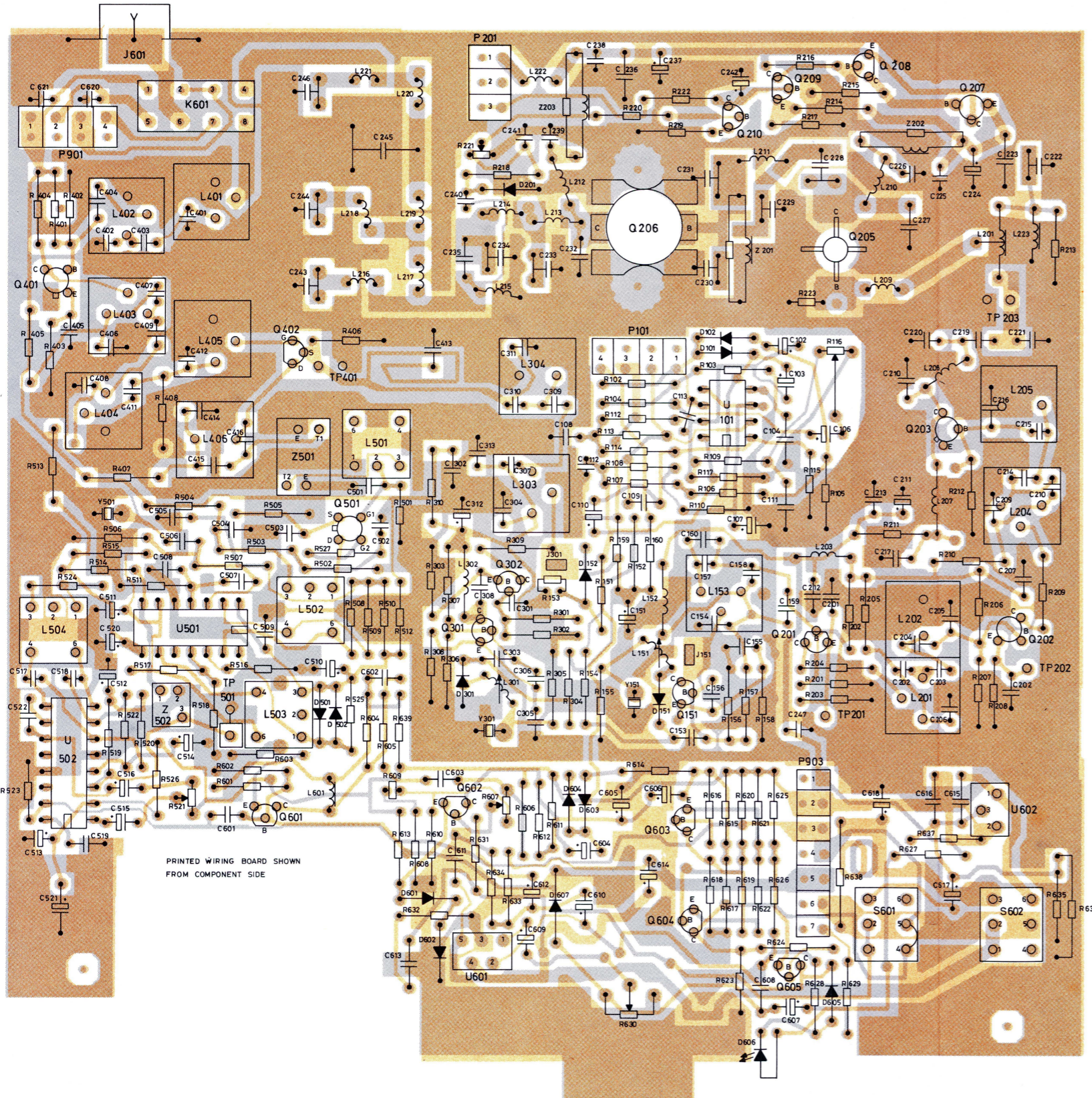
CAPACITOR VALUES IN PICOPARADS (EQUAL
TO MICROMICROPARADS) UNLESS FOLLOWED
BY μ P MICROPARADS. INDUCTANCE VALUES
IN NANOHENRYS UNLESS FOLLOWED BY
 μ H MICROHENRYS. MH = MILLISECOND

COMP	25W	5W	COMP	25W	5W
L 214	YES	-	C 228	270pF	-
L 215	YES	-	C 229	68pF	100pF
L 225	YES	-	C 230	470pF	47pF
L 224	YES	-	C 231	470pF	-
Q 206	YES	-	C 232	82 pF	-
			C 233	200pF	-
			C 234	85pF	-
			C 235	100pF	-
			C 236	470pF	-
			C 249	-	22pF
			C 248	-	10pF
			Z 201	YES	-
			Z 203	YES	-
			L 211	A	B
			L 212	YES	-
			L 213	YES	-

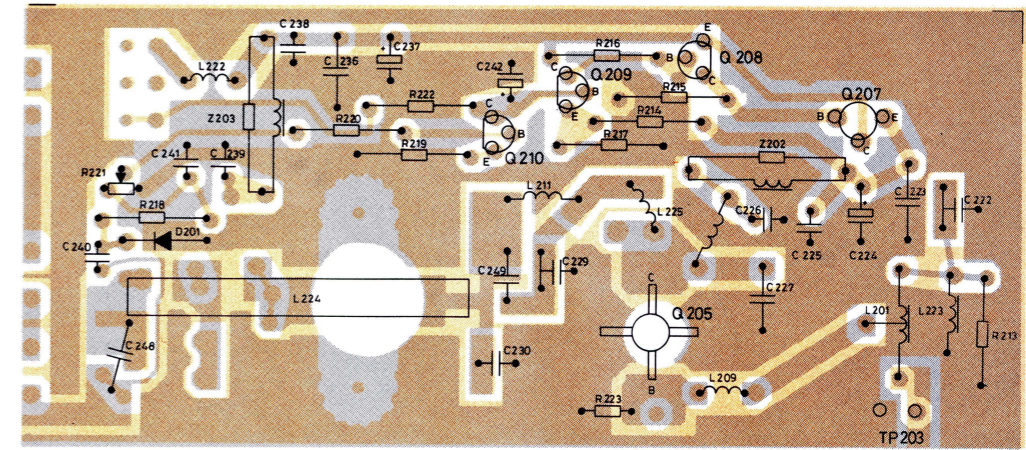
▲ PART OF PRINTED WIRE BOARD



6 WATT TRANSMITTER



PRINTED WIRING BOARD SHOWN FROM COMPONENT SIDE



RF UNIT RF 5330
25W, 6W

D402.776

TYPE	Nº	CODE	DATA
	C102	73. 5172	4. 7uF 20% Tantal
	C103	73. 5172	4. 7uF 20% Tantal
	C104	76. 5142	47nF 5% Polyester FL
	C106	73. 5170	1. 0uF 20% Tantal
	C107	73. 5172	4. 7uF 20% Tantal
5332	C108	76. 5140	6. 8nF 5% Polyester FL
5333	C108	76. 5140	6. 8nF 5% Polyester FL
5334	C108	76. 5135	10nF 5% Polyester FL
	C109	76. 5156	1nF 5% Polyester FL
	C110	73. 5172	4. 7uF 20% Tantal
	C111	76. 5151	68nF 5% Polyester FL
	C112	74. 5392	150pF 5% Ceram DI
	C113	74. 5374	18pF 5% Ceram DI
	C151	73. 5173	10uF 20% Tantal
	C153	74. 5389	330pF 5% Ceram DI
	C154	74. 5398	1. 5nF 20% Ceram DI
	C155	74. 5389	330pF 5% Ceram DI
	C156	74. 5417	100pF 5% Ceram DI
	C157	74. 5372	12pF 5% Ceram DI
	C158	74. 5372	12pF 5% Ceram DI
	C159	74. 5380	56pF 5% Ceram DI
	C160	74. 5380	56pF 5% Ceram DI
	C201	74. 5398	1. 5nF 20% Ceram DI
	C202	74. 5373	15pF 5% Ceram DI
	C203	79. 5007	0. 82pF Phenolic TB
	C204	74. 5374	18pF 5% Ceram DI
	C205	74. 5382	82pF 5% Ceram DI
	C206	74. 5398	1. 5nF 20% Ceram DI
	C207	74. 5398	1. 5nF 20% Ceram DI
	C208	74. 5398	1. 5nF 20% Ceram DI
	C209	74. 5398	1. 5nF 20% Ceram DI
	C210	74. 5373	15pF 5% Ceram DI
	C211	73. 5171	2. 2uF 20% Tantal
	C212	74. 5397	1nF 20% Ceram DI
	C213	74. 5397	1nF 20% Ceram DI
	C214	79. 5008	1pF Phenolic TB
	C215	74. 5373	15pF 5% Ceram DI
	C216	74. 5379	47pF 5% Ceram DI
	C217	74. 5397	1nF 20% Ceram DI
	C218	74. 5376	27pF 5% Ceram DI
	C219	74. 5397	1nF 20% Ceram DI
	C220	74. 5377	33pF 5% Ceram DI
	C221	74. 5379	47pF 5% Ceram DI
	C222	75. 5047	240pF 2% Mica
	C223	76. 5144	0. 1uF 10% Polyester FL
	C224	73. 5173	10uF 20% Tantal
	C225	74. 5392	150pF 5% Ceram DI

TYPE	Nº	CODE	DATA
	C226	74. 5395	470pF 20% Ceram DI
	C227	74. 5415	27pF 5% Ceram DI
25W	C228	75. 5048	270pF 5% Mica
25W	C229	75. 5046	68pF 5% Mica
6W	C229	75. 5026	110pF 5% Mica
6W	C230	75. 5044	47pF 2% Teflon
25W	C230	75. 5049	470pF 5% Mica
25W	C231	75. 5049	470pF 5% Mica
25W	C232	74. 5418	56pF 5% Ceram DI
25W	C233	75. 5047	240pF 2% Mica
25W	C234	75. 5032	82pF 2% Mica
25W	C235	75. 5020	100pF 5% Mica
	C236	76. 5144	0. 1uF 10% Polyester FL
	C237	73. 5172	4. 7uF 20% Tantal
	C238	74. 5392	150pF 5% Ceram DI
	C239	74. 5395	470pF 20% Ceram DI
25W	C240	74. 5365	3. 3pF 0. 25pF Ceram DI
	C241	74. 5392	150pF 5% Ceram DI
	C242	73. 5173	10uF 20% Tantal
	C243	75. 5043	16pF 0. 5pF Teflon
	C244	75. 5044	47pF 2% Teflon
	C245	75. 5045	56pF 2% Mica
	C246	75. 5043	16pF 0. 5pF Teflon
	C247	74. 5398	1. 5nF 20% Ceram DI
6W	C248	74. 5015	1nF -20 +50% Ceram DI
6W	C249	74. 5375	22pF 5% Ceram DI
	C301	74. 5398	1. 5nF 20% Ceram DI
	C302	76. 5135	10nF 10% Polyester FL
	C303	74. 5386	180pF 5% Ceram DI
	C304	74. 5398	1. 5nF 20% Ceram DI
	C305	19J706256P216	100pF 5% Ceram DI
	C306	19A700002P35	27pF 5% Ceram DI
	C307	74. 5372	12pF 5% Ceram DI
	C308	74. 5386	180pF 5% Ceram DI
	C309	79. 5005	0. 56pF Phenolic TB
	C310	74. 5372	12pF 5% Ceram DI
	C311	74. 5375	22pF 5% Ceram DI
	C312	73. 5172	4. 7uF 20% Tantal
	C313	74. 5375	22pF 5% Ceram DI
	C401	74. 5373	15pF 5% Ceram DI
	C402	74. 5373	15pF 5% Ceram DI
	C403	79. 5007	0. 82pF Phenolic TB

RF UNIT RF5330

X402. 774/3

TYPE	Nº	CODE	DATA
	C404	74. 5398	1. 5nF 20% Ceram DI
	C405	74. 5398	1. 5nF 20% Ceram DI
	C406	74. 5398	1. 5nF 20% Ceram DI
	C407	74. 5373	15pF 5% Ceram DI
	C408	74. 5373	15pF 5% Ceram DI
	C409	79. 5008	1pF Phenolic TB
	C411	74. 5366	3. 9pF 0. 25pF Ceram DI
	C412	74. 5372	12pF 5% Ceram DI
	C413	76. 5132	3. 3nF 10% Polyester FL
	C414	76. 5135	10nF 10% Polyester FL
	C415	74. 5389	330pF 5% Ceram DI
	C416	19J706280P1	2. 2nF 10% Ceram
	C501	74. 5375	22pF 5% Ceram DI
	C502	74. 5395	470pF 20% Ceram DI
	C503	76. 5135	10nF 10% Polyester FL
	C504	76. 5135	10nF 10% Polyester FL
	C505	76. 5135	10nF 10% Polyester FL
	C506	74. 5379	47pF 5% Ceram DI
	C507	74. 5383	100pF 5% Ceram DI
	C508	74. 5387	220pF 5% Ceram DI
	C509	76. 5133	4. 7nF 10% Polyester FL
	C510	73. 5170	1. 0uF 20% Tantal
	C511	73. 5168	0. 22uF 20% Tantal
	C512	73. 5170	1. 0uF 20% Tantal
	C513	73. 5170	1. 0uF 20% Tantal
	C514	73. 5170	1. 0uF 20% Tantal
	C515	73. 5168	0. 22uF 20% Tantal
	C516	73. 5168	0. 22uF 20% Tantal
	C517	74. 5393	220pF 20% Ceram DI
	C518	74. 5393	220pF 20% Ceram DI
	C519	74. 5397	1nF 20% Ceram DI
	C520	73. 5170	1. 0uF 20% Tantal
	C521	73. 5166	470uF -10 +100% Elco
	C522	76. 5132	3. 3nF 10% Polyester FL
	C601	76. 5133	4. 7nF 10% Polyester FL
	C602	76. 5134	6. 8nF 10% Polyester FL
	C603	76. 5139	47nF 10% Polyester FL
	C604	73. 5172	4. 7uF 20% Tantal
	C605	73. 5164	47uF -10 +100% Elco
	C606	73. 5170	1. 0uF 20% Tantal
	C607	73. 5169	0. 47uF 20% Tantal
	C608	76. 5144	0. 1uF 10% Polyester FL
	C609	73. 5172	4. 7uF 20% Tantal
	C610	73. 5175	47uF 20% Tantal
	C611	76. 5144	0. 1uF 10% Polyester FL
	C612	73. 5168	0. 22uF 20% Tantal
	C613	76. 5148	0. 47uF 10% Polyester FL
	C614	73. 5166	470uF -10 +100% Elco

TYPE	Nº	CODE	DATA
	C615	76. 5143	68nF 10% Polyester FL
	C616	76. 5143	68nF 10% Polyester FL
	C617	73. 5164	47uF -10 +100% Elco
	C618	73. 5165	220uF -10 +100% Elco
	C620	74. 5395	470pF 20% Ceram DI
	C621	74. 5395	470pF 20% Ceram DI
	C634	80. 5213	1ohm 5% Carbon film
	D101	99. 5374	Diode
	D102	99. 5374	Diode
	D151	99. 5373	BB109G Cap. diode
	D152	99. 5237	1N4148 Diode
	D301	99. 5341	Cap. diode
	D501	99. 5237	1N4148 Diode
	D502	99. 5237	1N4148 Diode
	D601	99. 5237	1N4148 Diode
	D602	99. 5237	1N4148 Diode
	D603	99. 5237	1N4148 Diode
	D604	99. 5237	1N4148 Diode
	D605	99. 5237	1N4148 Diode
	D606	99. 5303	Diode LED
	D607	99. 5237	1N4148 Diode
	J151	41. 5529	Socket
	J301	41. 5529	Socket
	J601	41. 5165	Connector
	K601	58. 5085	2121 Relay
	L151	61. 5052	16-22MHz RF coil
	L152	61. 5031	10uH 10% RF choke
	L153	61. 5057	33-44MHz RF coil
	L201	61. 5054	66-88MHz RF coil
	L201	99. 5237	1N4148 Diode
	L202	61. 5058	66-88MHz RF coil
	L203	61. 1383	RF choke
	L204	61. 5059	66-88MHz RF coil
	L205	61. 5058	66-88MHz RF coil
	L207	61. 5030	1. 5uH 10% RF choke
	L209	62. 1017	RF coil
	L210	62. 1018	RF coil
	L211	62. 1019	RF coil
	L211	62. 1025	RF coil
	L212	62. 1020	RF coil
	L213	62. 1021	RF coil
	L214	62. 1022	RF coil
25W			
6W			
25W			
25W			
25W			
			1. 6V 20mA
			12V
			300mA
			800mA

RF UNIT RF5330

X402. 774/3

TYPE	Nº	CODE	DATA
25W	L215	62.1023	RF coil
	L216	62.1024	RF coil
	L217	62.1026	RF coil
	L218	62.1019	RF coil
	L219	62.1026	RF coil
	L220	62.1026	RF coil
	L221	62.1027	RF coil
	L222	62.0981	RF coil
	L223	61.1383	RF choke
	L224	62.1029	RF coil
	L225	62.1028	RF coil
	L201	61.5051	38-50MHz RF coil
	L302	61.5015	3.3uH 10% HF choke
	L303	61.5055	76-99MHz RF coil
	L304	61.5056	76-99MHz RF coil
	L401	61.5053	66-88MHz RF coil
	L402	61.5053	66-88MHz RF coil
	L403	61.5054	66-88MHz RF coil
	L404	61.5053	66-88MHz RF coil
	L405	61.5054	66-88MHz RF coil
L406	61.5050	10.7MHz RF coil	
L501	61.5026	10.7MHz IF transformer	
L502	61.5026	10.7MHz IF transformer	
L503	61.5025	455kHz IF transformer	
L504	61.5025	455kHz IF transformer	
L601	61.5023	75uH 10% Choke	
P101	41.5541	Fem. connector	
P201	41.5545	Fem. connector	
P901	41.5541	Fem. connector	
P903	41.0230	Fem. connector	
Q151	99.0001	PN2369 Transistor	
Q201	99.0001	PN2369 Transistor	
Q202	99.5348	RF transistor	
Q203	99.5349	RF transistor	
Q205	99.5369	BLY87C Transistor	
Q206	99.5368	RF transistor	
Q207	99.5345	BD201 Transistor	
Q208	99.5251	BC307 Transistor	
Q209	99.5121	BC237 Transistor	
Q210	99.5121	BC237 Transistor	
Q301	99.0001	PN2369 Transistor	
Q302	99.5347	PN2369 Transistor	
Q401	99.5240	BFX89 Transistor	
Q402	99.5245	2N5245 Transistor	
Q501	99.5291	3N205 Transistor	
Q601	99.5143	BC238 Transistor	
Q602	99.5201	BC602 Transistor	
6W 6W			700mA

TYPE	Nº	CODE	DATA
5332 5333 5334	Q603	99.5115	BC309 Transistor
	Q604	99.5115	BC309 Transistor
	Q605	99.5115	BC309 Transistor
	R102	80.5265	22Kohm 5% Carbon film
	R103	80.5243	330ohm 5% Carbon film
	R104	89.5095	51Kohm 5% Carbon film
	R105	89.5083	10.5Kohm 1% Metal film
	R106	89.5085	12.7Kohm 1% Metal film
	R107	89.5083	10.5Kohm 1% Metal film
	R108	89.5082	5.11Kohm 1% Metal film
	R109	89.5091	1.3Kohm 5% Carbon film
	R109	89.5252	1.3Kohm 5% Carbon film
	R110	89.5082	1.8Kohm 5% Carbon film
	R112	89.5086	5.11Kohm 1% Metal film
	R113	89.5084	20Kohm 1% Metal film
	R114	89.5087	12.4Kohm 1% Metal film
	R115	80.5253	32.4Kohm 1% Metal film
	R116	86.5050	2.2Kohm 5% Carbon film
	R117	80.5254	5Kohm 20% Trim Carbon
	R151	80.5259	2.7Kohm 5% Carbon film
R152	80.5259	6.8Kohm 5% Carbon film	
R153	89.5088	6.8Kohm 5% Carbon film	
R154	80.5269	3.3Kohm 10% NTC	
R155	80.5252	47Kohm 5% Carbon film	
R156	80.5259	1.8Kohm 5% Carbon film	
R157	80.5261	6.8Kohm 5% Carbon film	
R158	80.5242	10Kohm 5% Carbon film	
R159	80.5263	270ohm 5% Carbon film	
R160	80.5257	15Kohm 5% Carbon film	
R201	80.5249	4.7Kohm 5% Carbon film	
R202	80.5257	1Kohm 5% Carbon film	
R203	80.5233	4.7Kohm 5% Carbon film	
R204	80.5233	47ohm 5% Carbon film	
R205	80.5233	47ohm 5% Carbon film	
R206	80.5254	2.7Kohm 5% Carbon film	
R207	80.5241	220ohm 5% Carbon film	
R208	80.5225	10ohm 5% Carbon film	
R209	80.5225	10ohm 5% Carbon film	
R210	80.5229	22ohm 5% Carbon film	
R211	80.5228	18ohm 5% Carbon film	

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TYPE	Nº	CODE	DATA
	R212	80. 5237	100ohm 5% Carbon film 1/8W
	R213	80. 5234	56ohm 5% Carbon film 1/8W
	R214	80. 5245	470ohm 5% Carbon film 1/8W
	R215	80. 5246	560ohm 5% Carbon film 1/8W
	R216	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R217	80. 5241	220ohm 5% Carbon film 1/8W
	R218	80. 5257	4.7Kohm 5% Carbon film 1/8W
	R219	80. 5249	1Kohm 5% Carbon film 1/8W
	R220	80. 5253	2.2Kohm 5% Carbon film 1/8W
	R221	86. 5078	5Kohm 20% Trim Cermet 0.5W
	R222	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R223	89. 5104	22ohm 5% Carbon comp. 1/8W
	R301	80. 5255	6.8Kohm 5% Carbon film 1/8W
	R302	80. 5255	3.3Kohm 5% Carbon film 1/8W
	R303	90. 5242	270ohm 5% Carbon film 1/8W
	R304	80. 5269	47Kohm 5% Carbon film 1/8W
	R305	80. 5247	680ohm 5% Carbon film 1/8W
	R306	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R307	80. 5261	10Kohm 5% Carbon film 1/8W
	R308	80. 5242	270ohm 5% Carbon film 1/8W
	R309	80. 5229	22ohm 5% Carbon film 1/8W
	R310	80. 5225	10ohm 5% Carbon film 1/8W
	R401	80. 5257	4.7Kohm 5% Carbon film 1/8W
	R402	80. 5251	1.5Kohm 5% Carbon film 1/8W
	R403	80. 5237	100ohm 5% Carbon film 1/8W
	R404	80. 5245	470ohm 5% Carbon film 1/8W
	R405	80. 5233	47ohm 5% Carbon film 1/8W
	R406	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R407	80. 5237	100ohm 5% Carbon film 1/8W
	R408	80. 5244	2.7Kohm 5% Carbon film 1/8W
	R501	80. 5249	1Kohm 5% Carbon film 1/8W
	R502	80. 5266	27Kohm 5% Carbon film 1/8W
	R503	80. 5266	27Kohm 5% Carbon film 1/8W
	R504	80. 5243	330ohm 5% Carbon film 1/8W
	R505	80. 5242	270ohm 5% Carbon film 1/8W
	R506	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R507	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R508	80. 5253	2.2Kohm 5% Carbon film 1/8W
	R509	80. 5253	2.2Kohm 5% Carbon film 1/8W
	R510	80. 5262	12Kohm 5% Carbon film 1/8W
	R511	80. 5247	680ohm 5% Carbon film 1/8W
	R512	80. 5243	330ohm 5% Carbon film 1/8W
	R513	80. 5243	330ohm 5% Carbon film 1/8W
	R514	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R515	80. 5262	12Kohm 5% Carbon film 1/8W
	R516	80. 5247	680ohm 5% Carbon film 1/8W
	R517	80. 5259	6.8Kohm 5% Carbon film 1/8W

TYPE	Nº	CODE	DATA
	R518	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R519	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R520	80. 5261	10Kohm 5% Carbon film 1/8W
	R521	86. 5060	25Kohm 20% Trim Carbon 0.1W
	R522	80. 5261	10Kohm 5% Carbon film 1/8W
	R523	80. 5255	3.3Kohm 5% Carbon film 1/8W
	R524	80. 5268	39Kohm 5% Carbon film 1/8W
	R525	80. 5268	39Kohm 5% Carbon film 1/8W
	R526	80. 5221	4.7ohm 5% Carbon film 1/8W
	R527	80. 5237	100ohm 5% Carbon film 1/8W
	R601	80. 5269	47Kohm 5% Carbon film 1/8W
	R602	80. 5265	22Kohm 5% Carbon film 1/8W
	R603	80. 5243	330ohm 5% Carbon film 1/8W
	R604	80. 5264	18Kohm 5% Carbon film 1/8W
	R605	80. 5261	10Kohm 5% Carbon film 1/8W
	R606	80. 5278	270Kohm 5% Carbon film 1/8W
	R607	86. 5080	10Kohm 20% Trim Carbon 0.1W
	R608	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R609	89. 5053	470ohm 20% NTC 0.6W
	R610	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R611	80. 5238	120ohm 5% Carbon film 1/8W
	R612	80. 5245	470ohm 5% Carbon film 1/8W
	R613	80. 5248	820ohm 5% Carbon film 1/8W
	R614	80. 5256	3.9Kohm 5% Carbon film 1/8W
	R615	80. 5269	47Kohm 5% Carbon film 1/8W
	R616	80. 5261	10Kohm 5% Carbon film 1/8W
	R617	80. 5280	390Kohm 5% Carbon film 1/8W
	R618	80. 5262	12Kohm 5% Carbon film 1/8W
	R619	80. 5266	27Kohm 5% Carbon film 1/8W
	R620	80. 5266	27Kohm 5% Carbon film 1/8W
	R621	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R622	80. 5243	330ohm 5% Carbon film 1/8W
	R623	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R624	80. 5261	10Kohm 5% Carbon film 1/8W
	R625	89. 5093	3Kohm 5% Carbon film 1/8W
	R626	80. 5249	1Kohm 5% Carbon film 1/8W
	R627	80. 5240	180ohm 5% Carbon film 1/8W
	R628	80. 5239	150ohm 5% Carbon film 1/8W
	R629	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R630	86. 5077	47Kohm 20% Carbon pot. 0.15W
	R631	80. 5229	22ohm 5% Carbon film 1/8W

RF UNIT RF5330

X402.774/3

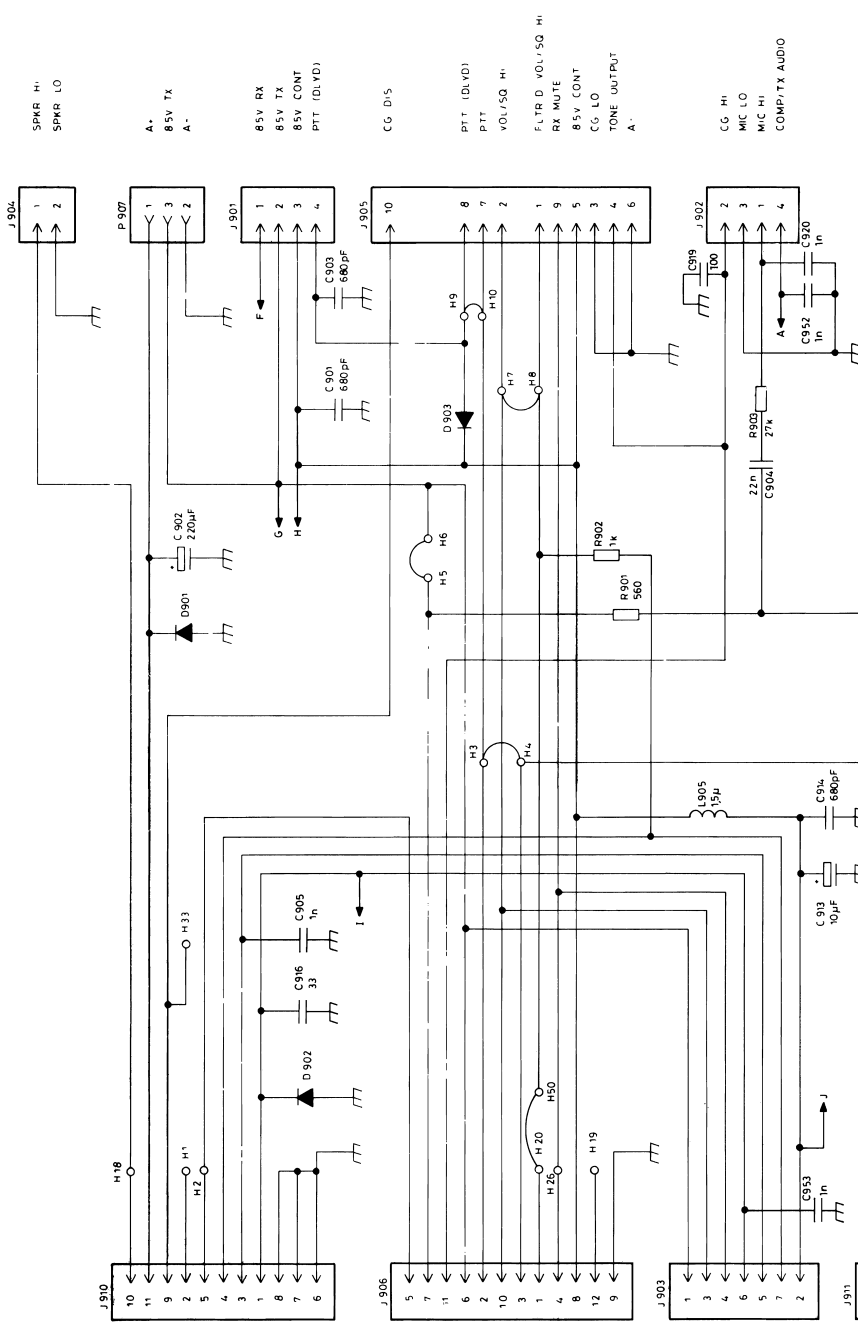
TO SPEAKER

PA SUPPLY

RELAY

CHANNEL GUARD

TX AUDIO PROCESSOR



SPKR HI
SPKR LO

A.
8.5V TX
A.

8.5V RX
8.5V TX
8.5V CONT
PTT (DI.VD)

CG D-5

PTT (DI.VD)
PTT
VOL/SQ HI

FLTR D VOL/SQ HI
RX MUTE
8.5V CONT
CG LO
TONE OUTPUT
A.

CG HI
MIC LO
MIC HI
COMPTX AUDIO

INTERNAL SPKR HI

A.
CG DISABLE
SPARE

CG DISABLE/TONE KEY
FLTR D VOL/SQ HI

SPKR HI
A.

SPKR LO
A.

TONE KEY
MIC BLOCK
TONE OUTPUT
8.5V TX
PTT (TO RELAY)
VOL/SQ HI
PTT
MUTE
RX MUTE
8.5V TX
ALARM
A.

8.5V TX
VOL/SQ HI
RX MUTE
A.
SPKR HI
FLTR D VOL/SQ HI
8.5V TX

PTT
MIC HI
MIC LO
CHAN COM
FREQ BIT 2
FREQ BIT 1
FREQ BIT 0
A.

TO MICROPHONE

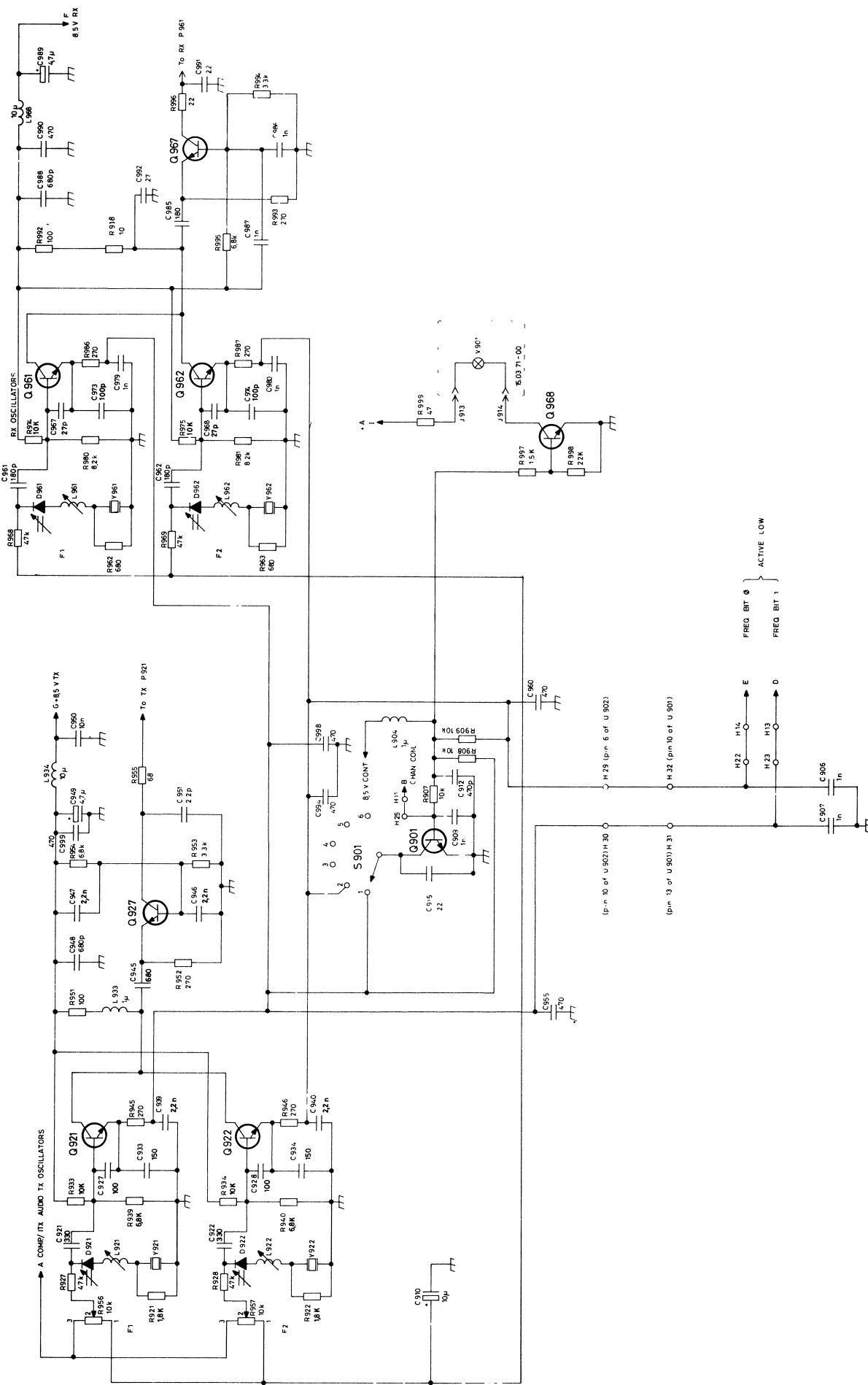
ALTERNATIVE FUNCTIONS WITH CG UNITS
TO 5003, TT 5001, TR 5001, FN 5001

THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE-
OPTIONS (T-NUMBERS) ARE INSTALLED IN COM4500 SETS

XS 5331	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H32 - H28	+	+	+	+	+	+	+	+	+
H31 - H30	+	+	+	+	+	+	+	+	+
H3 - H4	-	-	-	-	-	-	-	-	-
H5 - H6	-	-	-	-	-	-	-	-	-
H7 - H8	-	-	-	-	-	-	-	-	-
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	+	+	+	+	+	+	+	+

CHANNEL SELECTOR UNIT
XS 5331

D402.771



CHANNEL SELECTOR UNIT
 OSCILLATOR SECTION
 XS 5331

TYPE	Nº	CODE	DATA
	C901	74. 5396	680pF 20% Ceramic DI
	C902	73. 5165	220uF -20 +100% Elco
	C903	74. 5396	680pF 20% Ceramic DI
	C904	76. 5141	22nF 5% Polyester FL
	C905	74. 5397	1nF 20% Ceramic DI
	C906	74. 5397	1nF 20% Ceramic DI
	C907	74. 5397	1nF 20% Ceramic DI
	C909	74. 5397	1nF 20% Ceramic DI
	C910	73. 5173	10uF 20% Tantal
	C912	74. 5395	470pF 20% Ceramic DI
	C913	73. 5173	10uF 20% Tantal
	C914	74. 5396	680pF 20% Ceramic DI
	C915	74. 5375	22pF 5% Ceramic DI
	C916	74. 5377	33pF 5% Ceramic DI
	C917	74. 5391	100pF 20% Ceramic DI
	C918	74. 5391	100pF 20% Ceramic DI
	C919	74. 5391	100pF 20% Ceramic DI
	C920	74. 5391	100pF 20% Ceramic DI
	C921	74. 5389	330pF 5% Ceramic DI
	C922	74. 5389	330pF 5% Ceramic DI
	C927	74. 5417	100pF 5% Ceramic DI
	C928	74. 5417	100pF 5% Ceramic DI
	C933	74. 5385	150pF 5% Ceramic DI
	C934	74. 5385	150pF 5% Ceramic DI
	C939	74. 5399	2. 2nF 20% Ceramic DI
	C940	74. 5399	2. 2nF 20% Ceramic DI
	C945	74. 5396	680pF 20% Ceramic DI
	C946	74. 5399	2. 2nF 20% Ceramic DI
	C947	74. 5399	2. 2nF 20% Ceramic DI
	C948	74. 5396	680pF 20% Ceramic DI
	C949	73. 5172	4. 7uF 20% Tantal
	C950	76. 5135	10nF 10% Polyester FL
	C951	74. 5363	2. 2pF 0. 25pF Ceramic DI
	C952	74. 5391	100pF 20% Ceramic DI
	C953	74. 5397	1nF 20% Ceramic DI
	C955	74. 5395	470pF 20% Ceramic DI
	C960	74. 5395	470pF 20% Ceramic DI
	C961	74. 5386	180pF 5% Ceramic DI
	C962	74. 5386	180pF 5% Ceramic DI
	C967	74. 5403	18pF 5% Ceram DI
	C968	74. 5403	18pF 5% Ceramic DI
	C973	74. 5405	68pF 5% Ceramic DI
	C974	74. 5405	68pF 5% Ceramic DI
	C979	74. 5397	1nF 20% Ceramic DI
	C980	74. 5397	1nF 20% Ceramic DI
	C985	74. 5386	180pF 5% Ceramic DI
	C986	74. 5397	1nF 20% Ceramic DI

TYPE	Nº	CODE	DATA
	C987	74. 5397	1nF 20% Ceramic DI
	C988	74. 5396	680pF 20% Ceramic DI
	C989	73. 5172	4. 7uF 20% Tantal
	C990	74. 5395	470pF 20% Ceramic DI
	C991	74. 5263	2. 2pF 0. 25pF Ceramic DI
	C992	74. 5376	27pF 5% Ceramic DI
	C994	74. 5395	470pF 20% Ceramic DI
	C998	74. 5395	470pF 20% Ceramic DI
	D901	99. 5220	1N5401 Diode
	D902	99. 5220	1N5401 Diode
	D903	99. 5237	1N4148 Diode
	D921	99. 5373	Cap. diode
	D922	99. 5373	Cap. diode
	D961	99. 5341	Cap. diode
	D962	99. 5241	Cap. diode
	J901	41. 0228	Male connector
	J902	41. 0228	Male connector
	J903	41. 0229	Male Connector
	J904	41. 0225	Male Connector
	J905	41. 0245	Male connector
	J906	41. 0227	Male connector
	J907	41. 5545	Fem. connector
	J910	41. 0232	Male connector
	J911	41. 0231	Male connector
	L904	61. 5029	1. 0uH RF Choke
	L905	61. 5030	1. 5uH RF choke
	L921	61. 5052	16. 5-22MHz RF coil
	L922	61. 5052	16. 5-22MHz RF coil
	L933	61. 5015	3. 3uH RF choke
	L934	61. 5031	10uH RF choke
	L961	61. 5051	38-50MHz RF coil
	L962	61. 5051	38-50MHz RF coil
	L968	61. 5031	10uH RF choke
	P921	41. 5550	Connector
	P961	41. 5550	Connector
	Q901	99. 5121	BC237 Transistor
	Q921	99. 5347	PN2369A Transistor
	Q922	99. 5347	PN2369A Transistor
	Q927	99. 5347	PN2369A Transistor
	Q961	99. 5347	PN2369A Transistor
	Q962	99. 5347	PN2369A Transistor
	Q967	99. 5347	PN2369A Transistor

CHANNEL SWITCH XS5331

Storno**Storno**

TYPE	Nº	CODE	DATA
	Q968	99.5121	BC237 Transistor
	R902	80.5249	1Kohm 5% Carbon film
	R903	80.5266	27Kohm 5% Carbon film
	R907	80.5261	10Kohm 5% Carbon film
	R908	80.5261	10Kohm 5% Carbon film
	R909	80.5261	10Kohm 5% Carbon film
	R918	80.5225	10ohm 5% Carbon film
	R921	80.5252	1.8Kohm 5% Carbon film
	R922	80.5252	1.8Kohm 5% Carbon film
	R927	80.5269	47Kohm 5% Carbon film
	R928	80.5269	47Kohm 5% Carbon film
	R933	80.5261	10Kohm 5% Carbon film
	R934	80.5261	10Kohm 5% Carbon film
	R939	80.5259	6.8Kohm 5% Carbon film
	R940	80.5259	6.8Kohm 5% Carbon film
	R945	80.5242	270ohm 5% Carbon film
	R946	80.5242	279ohm 5% Carbon film
	R951	80.5237	100ohm 5% Carbon film
	R952	80.5242	270ohm 5% Carbon film
	R953	80.5255	3.3Kohm 5% Carbon film
	R954	80.5259	6.8Kohm 5% Carbon film
	R955	80.5235	68ohm 5% Carbon film
	R956	86.5079	10Kohm 10% Trim Cermet
	R957	86.5079	10Kohm 10% Trim Cermet
	R962	80.5247	680ohm 5% Carbon film
	R963	80.5247	680ohm 5% Carbon film
	R968	80.5269	47Kohm 5% Carbon film
	R969	80.5269	47Kohm 5% Carbon film
	R974	80.5259	6.8Kohm 5% Carbon film
	R975	80.5259	6.8Kohm 5% Carbon film
	R980	80.5260	8.2Kohm 5% Carbon film
	R981	80.5260	8.2Kohm 5% Carbon film
	R986	80.5242	270ohm 5% Carbon film
	R987	80.5242	270ohm 5% Carbon film
	R992	80.5237	100ohm 5% Carbon film
	R993	80.5242	270ohm 5% Carbon film
	R994	80.5255	3.3Kohm 5% Carbon film
	R995	80.5259	6.8Kohm 5% Carbon film
	R996	80.5229	22ohm 5% Carbon film
	R997	80.5251	1.5Kohm 5% Carbon film
	R998	80.5265	22Kohm 5% Carbon film
	R999	80.5233	47ohm 5% Carbon film

TYPE

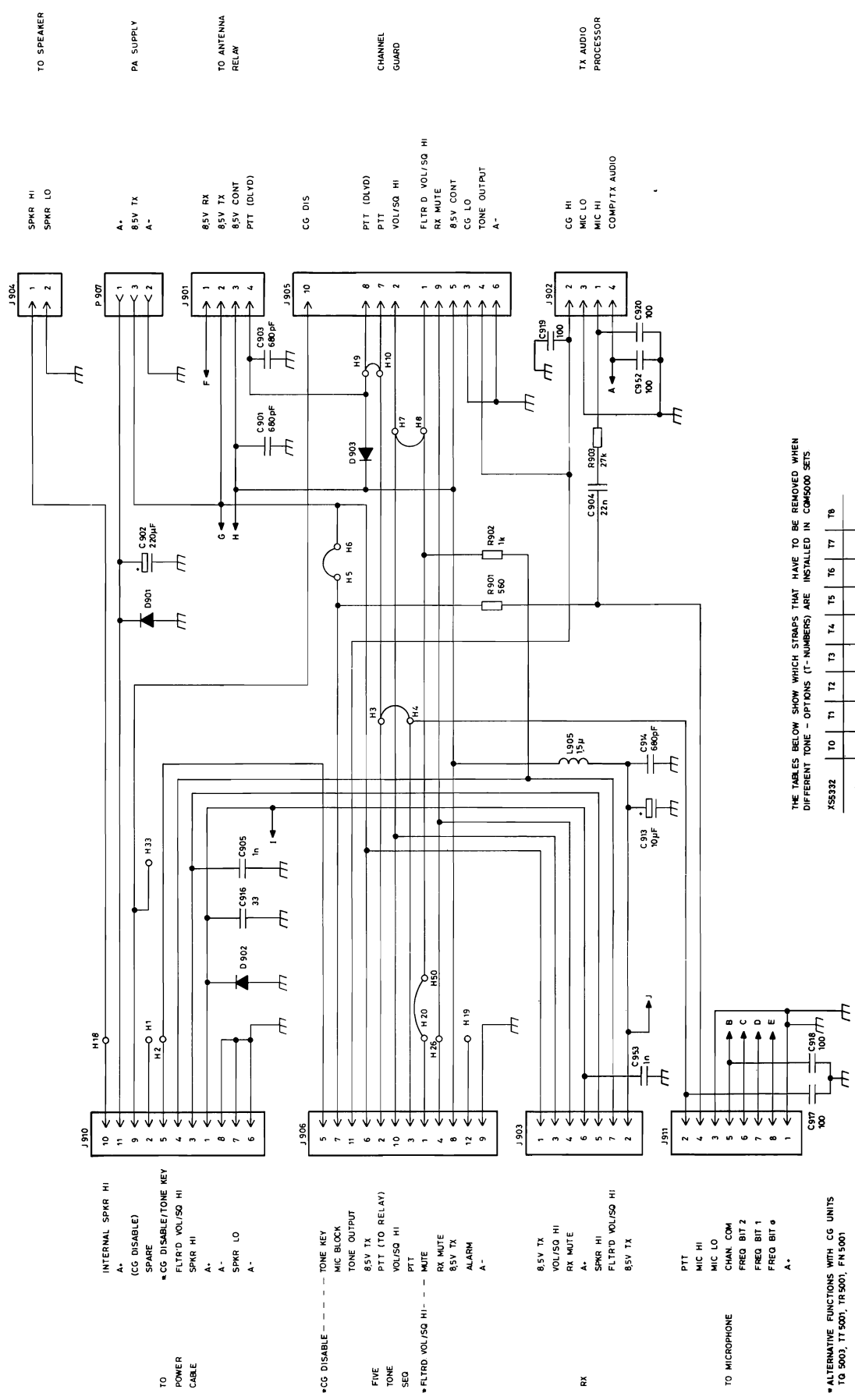
Nº

CODE

DATA

CHANNEL SWITCH XS5331

X402.779



INTERNAL SPKR HI
A.
(CG DISABLE)
SPARE
FLTRD VOL/50 HI
SPKR HI
A.
SPKR LO
A.

TO POWER CABLE

TO MICROPHONE

PTT
MIC HI
MIC LO
CHAN COM
FREQ BIT 2
FREQ BIT 1
FREQ BIT 0
A.

ALTERNATIVE FUNCTIONS WITH CG UNITS
TO 5003, TT 5001, TR 5001, FH 5001

TO SPEAKER

PA SUPPLY

TO ANTENNA RELAY

CHANNEL GUARD

TX AUDIO PROCESSOR

CG DIS

PTT (DLYD)
PTT
VOL/50 HI

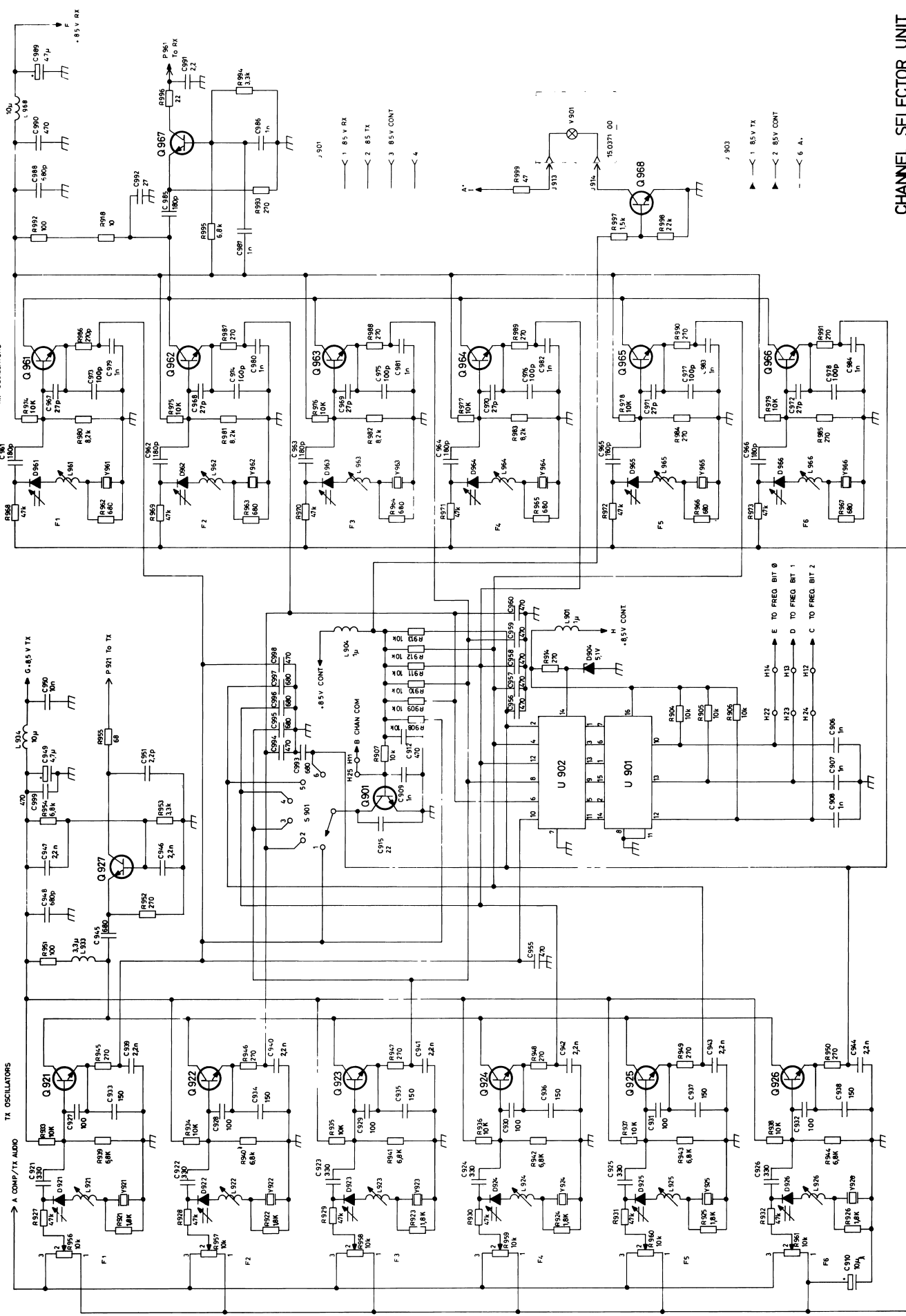
FLTR D VOL/50 HI
RX MUTE
8.5V TX
CG LO
TONE OUTPUT
A.

CG HI
MIC LO
MIC HI
COMPTX AUDIO

THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (-NUMBERS) ARE INSTALLED IN COM5000 SETS

XS5332	T0	T1	T2	T3	T4	T5	T6	T7	T8
H4 - H22	*	*	*	*	*	*	*	*	*
H3 - H23	*	*	*	*	*	*	*	*	*
H2 - H24	*	*	*	*	*	*	*	*	*
H1 - H25	*	*	*	*	*	*	*	*	*
H3 - H4	*	*	*	*	*	*	*	*	*
H5 - H6	*	*	*	*	*	*	*	*	*
H7 - H8	*	*	*	*	*	*	*	*	*
H9 - H10	*	*	*	*	*	*	*	*	*
H20 - H50	*	*	*	*	*	*	*	*	*

CHANNEL SELECTOR UNIT
XS 5332



TYPE	NO	CODE	DATA
	C901	74. 5396	680pF 20% Ceramic DI
	C901	74. 5396	680pF 20% Ceramic DI
	C902	73. 5165	220uF -20 +100% Elco
	C903	74. 5396	680pF 20% Ceramic DI
	C904	76. 5141	22nF 5% Polyester FL
	C905	74. 5397	1nF 20% Ceramic DI
	C905	74. 5397	1nF 20% Ceramic DI
	C906	74. 5397	1nF 20% Ceramic DI
	C907	74. 5397	1nF 20% Ceramic DI
	C908	74. 5397	1nF 20% Ceramic DI
	C909	74. 5397	1nF 20% Ceramic DI
	C910	73. 5173	10uF 20% Tantal
	C912	74. 5395	470pF 20% Ceramic DI
	C913	73. 5173	10uF 20% Tantal
	C914	74. 5396	680pF 20% Ceramic DI
	C915	74. 5375	22pF 5% Ceramic DI
	C916	74. 5377	33pF 5% Ceramic DI
	C917	74. 5391	100pF 20% Ceramic DI
	C918	74. 5391	100pF 20% Ceramic DI
	C919	74. 5391	100pF 20% Ceramic DI
	C920	74. 5391	100pF 20% Ceramic DI
	C921	74. 5389	330pF 5% Ceramic DI
	C921	74. 5389	330pF 5% Ceramic DI
	C922	74. 5389	330pF 5% Ceramic DI
	C923	74. 5389	330pF 5% Ceramic DI
	C924	74. 5389	330pF 5% Ceramic DI
	C924	74. 5395	470pF 20% Ceramic DI
	C925	74. 5389	330pF 5% Ceramic DI
	C926	74. 5389	330pF 5% Ceramic DI
	C927	74. 5417	100pF 5% Ceramic DI
	C927	74. 5417	100pF 5% Ceramic DI
	C928	74. 5417	100pF 5% Ceramic DI
	C929	74. 5417	100pF 5% Ceramic DI
	C930	74. 5417	100pF 5% Ceramic DI
	C931	74. 5417	100pF 5% Ceramic DI
	C932	74. 5417	100pF 5% Ceramic DI
	C933	74. 5385	150pF 5% Ceramic DI
	C933	74. 5385	150pF 5% Ceramic DI
	C934	74. 5385	150pF 5% Ceramic DI
	C935	74. 5384	150pF 5% Ceramic DI
	C936	74. 5385	150pF 5% Ceramic DI
	C937	74. 5385	150pF 5% Ceramic DI
	C938	74. 5385	150pF 5% Ceramic DI
	C939	74. 5399	2. 2nF 20% Ceramic DI
	C939	74. 5399	2. 2nF 20% Ceramic DI
	C940	74. 5399	2. 2nF 20% Ceramic DI
	C941	74. 5399	2. 2nF 20% Ceramic DI

TYPE	NO	CODE	DATA
	C942	74. 5399	2. 2nF 20% Ceramic DI
	C943	74. 5399	2. 2nF 20% Ceramic DI
	C944	74. 5399	2. 2nF 20% Ceramic DI
	C945	74. 5396	680pF 20% Ceramic DI
	C946	74. 5399	2. 2nF 20% Ceramic DI
	C947	74. 5399	2. 2nF 20% Ceramic DI
	C948	74. 5396	680pF 20% Ceramic DI
	C949	73. 5172	4. 7uF 20% Tantal
	C950	76. 5135	10nF 10% Polyester FL
	C951	74. 5363	2. 2pF 0. 25pF Ceramic DI
	C952	74. 5391	100pF 20% Ceramic DI
	C953	74. 5397	1nF 20% Ceramic DI
	C955	74. 5395	470pF 20% Ceramic DI
	C956	74. 5395	470pF 20% Ceramic DI
	C957	74. 5395	470pF 20% Ceramic DI
	C958	74. 5395	470pF 20% Ceramic DI
	C959	74. 5395	470pF 20% Ceramic DI
	C960	74. 5395	470pF 20% Ceramic DI
	C961	74. 5386	180pF 5% Ceramic DI
	C961	74. 5386	180pF 5% Ceramic DI
	C962	74. 5386	180pF 5% Ceramic DI
	C963	74. 5386	180pF 5% Ceramic DI
	C964	74. 5386	180pF 5% Ceramic DI
	C965	74. 5386	180pF 5% Ceramic DI
	C966	74. 5386	180pF 5% Ceramic DI
	C967	74. 5403	18pF 5% Ceram DI
	C967	74. 5403	18pF 5% Ceramic DI
	C968	74. 5403	18pF 5% Ceramic DI
	C969	74. 5403	18pF 5% Ceramic DI
	C970	74. 5403	18pF 5% Ceramic DI
	C971	74. 5403	18pF 5% Ceramic DI
	C971	74. 5403	18pF 5% Ceramic DI
	C973	74. 5405	68pF 5% Ceramic DI
	C973	74. 5405	68pF 5% Ceramic DI
	C974	74. 5405	68pF 5% Ceramic DI
	C975	74. 5405	68pF 5% Ceramic DI
	C976	74. 5405	68pF 5% Ceramic DI
	C977	74. 5405	68pF 5% Ceramic DI
	C978	74. 5405	68pF 5% Ceramic DI
	C979	74. 5397	1nF 20% Ceramic DI
	C980	74. 5397	1nF 20% Ceramic DI
	C981	74. 5397	1nF 20% Ceramic DI

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TYPE	Nº	CODE	DATA
C982	74.5397		1nF 20% Ceramic DI
C983	74.53.97		1nF 20% Ceramic DI
C984	74.5397		1nF 20% Ceramic DI
C985	74.5386		180pF 5% Ceramic DI
C986	74.5397		1nF 20% Ceramic DI
C987	74.5397		1nF 20% Ceramic DI
C988	74.5396		680pF 20% Ceramic DI
C989	73.5172		4.7uF 20% Tantal
C990	74.5395		470pF 20% Ceramic DI
C991	74.5263		2.2pF 0.25pF Ceramic DI
C992	74.5376		27pF 5% Ceramic DI
C993	74.5396		680pF 20% Ceramic DI
C994	74.5395		470pF 20% Ceramic DI
C995	74.5396		680pF 20% Ceramic DI
C996	74.5396		680pF 20% Ceramic DI
C997	74.5396		680pF 20% Ceramic DI
C998	74.5395		470pF 20% Ceramic DI
C999	74.5395		470pF 20% Ceramic DI
D901	99.5220		1N5401 Diode
D903	99.5237		1N4148 Diode
D904	99.5346		5.1V 5% Zenerdiode
D921	99.5373		Cap. diode
D921	99.5373		BB109C Cap. diode
D922	99.5373		Cap. diode
D923	99.5373		Cap. diode
D924	99.5373		Cap. diode
D925	99.5373		Cap. diode
D926	99.5373		Cap. diode
D961	99.5341		Cap. diode
D961	99.5341		Cap. diode
D962	99.5241		Cap. diode
D963	99.5341		Cap. diode
D964	99.5341		Cap. diode
D965	99.5341		Cap. diode
D966	99.5341		Cap. diode
J901	41.0228		Male connector
J902	41.0228		Male connector
J903	41.0229		Male Connector
J904	41.0225		Male Connector
J905	41.0245		Male connector
J906	41.0227		Male connector
J907	41.5545		Fem. connector
J910	41.0232		Male cconnector
J911	41.0231		Male connector
L901	61.5029		1.0uH RF choke
L904	61.5029		1.0uH RF Choke
L904	61.5029		1.0uH RF Choke
L905	61.5030		1.5uH RF choke

TYPE	Nº	CODE	DATA
L921	61.5052		16.5-22MHz RF coil
L921	61.5052		16.5-22MHz RF coil
L922	61.5052		16.5-22MHz RF coil
L923	61.5052		16.5-22MHz RF coil
L924	61.5052		16.5-22MHz RF coil
L925	61.5052		16.5-22MHz RF coil
L926	61.5052		16.5-22MHz RF coil
L933	61.5015		3.3uH RF choke
L934	61.5031		10uH RF choke
L961	61.5051		38-50MHz RF coil
L961	61.5051		38-50MHz RF coil
L962	61.5051		38-50MHz RF coil
L963	61.5051		38-50MHz RF coil
L964	61.5051		38-50MHz RF coil
L965	61.5051		38-50MHz RF coil
L966	61.5051		38-50MHz RF coil
L968	61.5031		10uH RF choke
P921	41.5550		Connector
P961	41.5550		Connector
Q901	99.5121		BC237 Transistor
Q921	99.5347		PN2369A Transistor
Q921	99.5347		PN2369A Transistor
Q922	99.5347		PN2369A Transistor
Q923	99.5347		PN2369A Transistor
Q924	99.5247		PN2369A Transistor
Q925	99.5347		PN2369A Transistor
Q926	99.5347		PN2369A Transistor
Q927	99.5347		PN2369A Transistor
Q961	99.5347		PN2369A Transistor
Q962	99.5347		PN2369A Transistor
Q963	99.5347		PN2369A Transistor
Q964	99.5347		PN2369A Transistor
Q965	99.5347		PN2369 Transistor
Q966	99.5347		PN2369A Transistor
Q967	99.5347		PN2369A Transistor
Q968	99.5121		BC237 Transistor
R902	80.5249		1Kohm 5% Carbon film
R903	80.5220		1N5401 Diode
R904	80.5266		27Kohm 5% Carbon film
R904	80.5261		10Kohm 5% Carbon film
R905	80.5261		10Kohm 5% Carbon film

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TYPE	Nº	CODE	DATA
	R906	80.5261	10Kohm 5% Carbon film
	R907	80.5261	10Kohm 5% Carbon film
	R907	80.5261	10Kohm 5% Carbon film
	R908	80.5261	10Kohm 5% Carbon film
	R909	80.5261	10Kohm 5% Carbon film
	R910	80.5261	10Kohm 5% Carbon film
	R911	80.5261	10Kohm 5% Carbon film
	R912	80.5261	10Kohm 5% Carbon film
	R913	80.5261	10Kohm 5% Carbon film
	R914	80.5242	270ohm 5% Carbon film
	R918	80.5225	10ohm 5% Carbon film
	R921	80.5252	1.8Kohm 5% Carbon film
	R921	80.5252	1.8Kohm 5% Carbon film
	R922	80.5252	1.8Kohm 5% Carbon film
	R923	80.5252	1.8Kohm 5% Carbon film
	R924	80.5252	1.8Kohm 5% Carbon film
	R925	80.5252	1.8Kohm 5% Carbon film
	R926	80.5249	1.8Kohm 5% Carbon film
	R927	80.5269	47Kohm 5% Carbon film
	R927	80.5269	47Kohm 5% Carbon film
	R928	80.5269	47Kohm 5% Carbon film
	R929	80.5269	47Kohm 5% Carbon film
	R930	80.5269	47Kohm 5% Carbon film
	R931	80.5269	47Kohm 5% Carbon film
	R932	80.5269	47Kohm 5% Carbon film
	R933	80.5261	10Kohm 5% Carbon film
	R934	80.5261	10Kohm 5% Carbon film
	R935	80.5261	10Kohm 5% Carbon film
	R936	80.5261	10Kohm 5% Carbon film
	R937	80.5261	10Kohm 5% Carbon film
	R938	80.5261	10Kohm 5% Carbon film
	R939	80.5259	6.8Kohm 5% Carbon film
	R940	80.5259	6.8Kohm 5% Carbon film
	R941	80.5259	6.8Kohm 5% Carbon film
	R942	80.5259	6.8Kohm 5% Carbon film
	R943	80.5259	6.8Kohm 5% Carbon film
	R944	80.5242	270ohm 5% Carbon film
	R945	80.5242	270ohm 5% Carbon film
	R946	80.5242	270ohm 5% Carbon film
	R947	80.5242	270ohm 5% Carbon film
	R948	80.5242	270ohm 5% Carbon film
	R949	80.5242	270ohm 5% Carbon film
	R950	80.5242	270ohm 5% Carbon film
	R951	80.5237	100ohm 5% Carbon film
	R952	80.5242	270ohm 5% Carbon film
	R953	80.5255	3.3Kohm 5% Carbon film
	R954	80.5259	6.8Kohm 5% Carbon film

TYPE	Nº	CODE	DATA
	R954	80.5259	6.8Kohm 5% Carbon film
	R955	80.5235	68ohm 5% Carbon film
	R956	86.5079	10Kohm 10% Trim Cermet
	R956	86.5079	10Kohm 10% Trim Cermet
	R957	86.5079	10Kohm 10% Trim Cermet
	R958	86.5079	10Kohm 10% Trim Cermet
	R960	86.5079	10Kohm 10% Trim Cermet
	R961	86.5079	10Kohm 10% Trim Cermet
	R962	80.5247	680ohm 5% Carbon film
	R962	80.5247	680ohm 5% Carbon film
	R963	80.5247	680ohm 5% Carbon film
	R964	80.5247	680ohm 5% Carbon film
	R965	80.5247	680ohm 5% Carbon film
	R966	80.5247	680ohm 5% Carbon film
	R967	80.5247	680ohm 5% Carbon film
	R968	80.5269	47Kohm 5% Carbon film
	R969	80.5269	47Kohm 5% Carbon film
	R969	86.5079	10Kohm 10% Trim Cermet
	R970	80.5269	47Kohm 5% Carbon film
	R971	80.5269	47Kohm 5% Carbon film
	R972	80.5269	47Kohm 5% Carbon film
	R973	80.5269	47Kohm 5% Carbon film
	R974	80.5259	6.8Kohm 5% Carbon film
	R975	80.5259	6.8Kohm 5% Carbon film
	R976	80.5259	6.8Kohm 5% Carbon film
	R977	80.5259	6.8Kohm 5% Carbon film
	R978	80.5259	6.8Kohm 5% Carbon film
	R979	80.5259	6.8Kohm 5% Carbon film
	R980	80.5260	8.2Kohm 5% Carbon film
	R980	80.5260	8.2Kohm 5% Carbon film
	R981	80.5260	8.2Kohm 5% Carbon film
	R982	80.5260	8.2Kohm 5% Carbon film
	R983	80.5260	8.2Kohm 5% Carbon film
	R984	80.5260	8.2Kohm 5% Carbon film
	R985	80.5260	8.2Kohm 5% Carbon film
	R986	80.5242	270ohm 5% Carbon film
	R987	80.5242	270ohm 5% Carbon film
	R988	80.5242	270ohm 5% Carbon film
	R989	80.5242	270ohm 5% Carbon film
	R990	80.5242	270ohm 5% Carbon film
	R991	80.5242	270ohm 5% Carbon film
	R992	80.5237	100ohm 5% Carbon film

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Storno

TYPE	Nº	CODE	DATA
	R993	80. 5242	270ohm 5% Carbon film
	R994	80. 5255	3. 3Kohm 5% Carbon film
	R995	80. 5259	6. 8Kohm 5% Carbon film
	R996	80. 5229	22ohm 5% Carbon film
	R997	80. 5251	1. 5Kohm 5% Carbon film
	R998	80. 5265	22Kohm 5% Carbon film
	R999	80. 5233	47ohm 5% Carbon film
	U901	14. 5133	4028 Decoder
	U902	14. 5025	6405N Hex inverter

1/8W
1/8W
1/8W
1/8W
1/8W
1/8W
1/8W

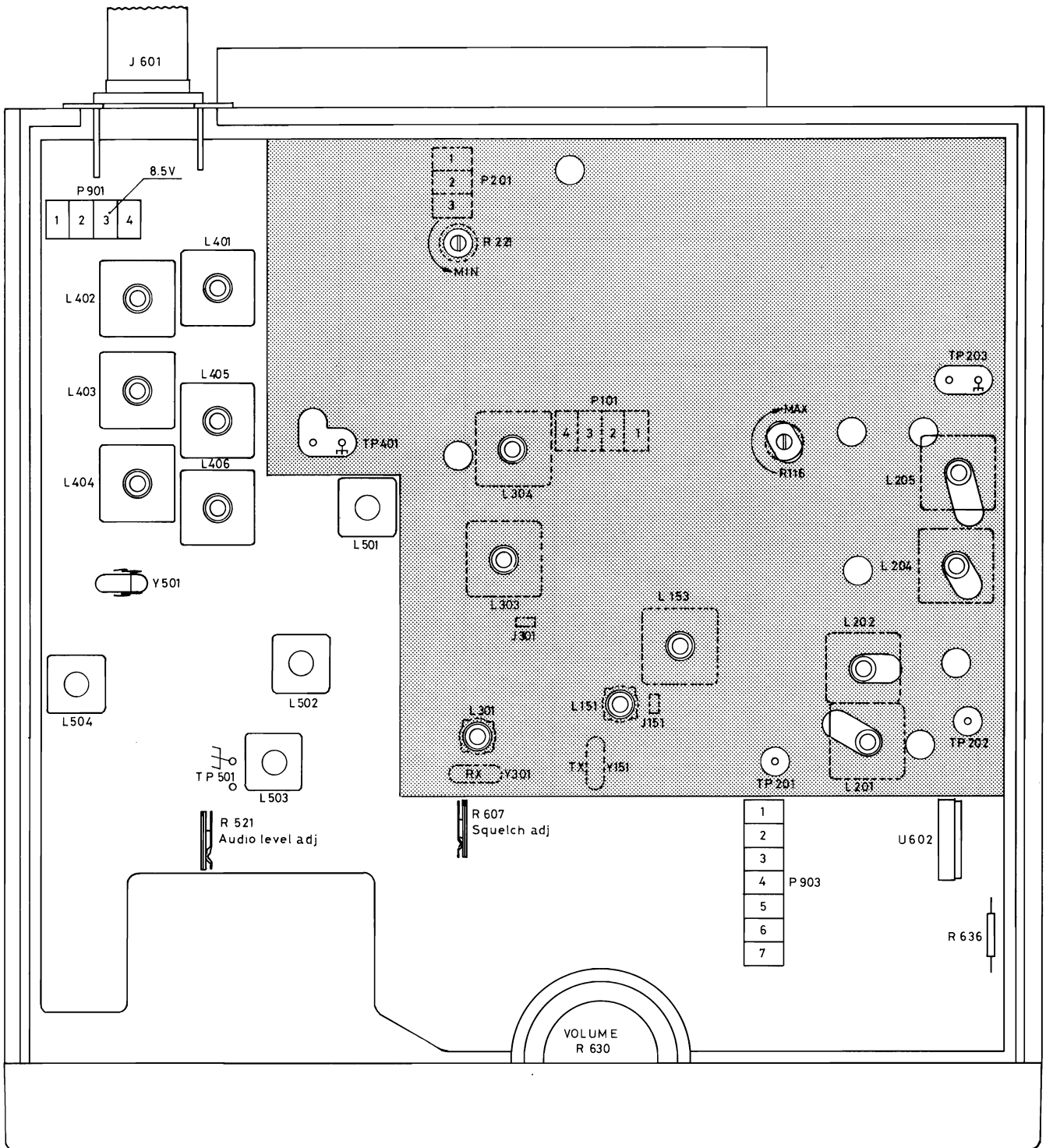
Storno

TYPE	Nº	CODE	DATA

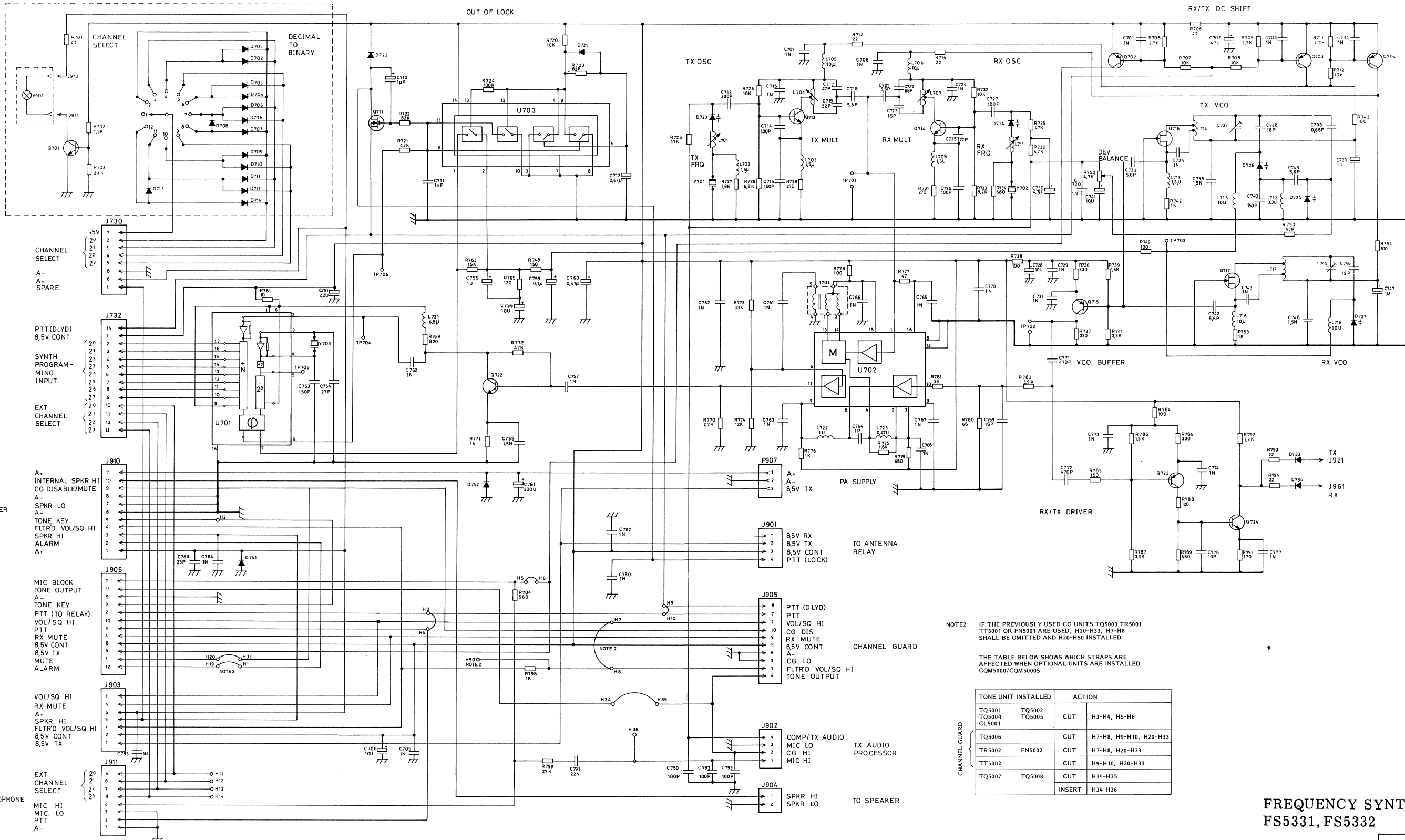
CHANNEL SWITCH XS5332

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ADJUSTABLE COMPONENTS AND TEST POINTS ON RF5330



NOTE2 IF THE PREVIOUSLY USED CG UNITS TQ5003 TR5001 TT5001 OR FN5001 ARE USED, H20-H33, H7-H8 SHALL BE OMITTED AND H20-H50 INSTALLED

THE TABLE BELOW SHOWS WHICH STRAPS ARE AFFECTED WHEN OPTIONAL UNITS ARE INSTALLED

TONE UNIT INSTALLED	ACTION
TQ5001	CUT
TQ5002	CUT
TQ5004	CUT
CL5001	CUT
TQ5006	CUT
TR5002	CUT
TT5002	CUT
TQ5007	CUT
TQ5008	INSERT

FREQUENCY SYNTHESIZER
FS5331, FS5332

STORNOPHONE 5000
Maintenance Manual
Section 5.

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	Schematic Diagram	D402.661
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XS5662	Schematic Diagram	D402.664
	Schematic Diagram	D402.662
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	Parts List	X402.689

Service Coordination

TECHNICAL SPECIFICATIONS

CQM5660

Guaranteed performance specifications unless otherwise noted.

Typical values are given in brackets.

GENERAL

Frequency Range

420 - 470MHz

Channel Separation

CQM5662: 30/25kHz

CQM5663: 20kHz

Maximum Frequency Deviation

CQM5662: ± 5 kHz

CQM5663: ± 4 kHz

Modulation Frequency Range

300 - 3000Hz

Maximum RF Bandwidth

RX: 3.0MHz

TX: 5.4MHz

Antenna Impedance

50 ohm

Maximum Number of Channels

6

Supply Voltage

Minimum: 10.8V

Nominal: 13.2V

Maximum: 16.6V

Negative potential to chassis

Temperature Range

-30°C to $+60^{\circ}\text{C}$

Dimensions

B x D x H: 180 x 190 x 60mm

Weight

1.8 Kg

RECEIVER

Sensitivity

12dB SINAD (EIA), $\frac{1}{2}$ e.m.f.

0.4uV (0.3uV)

Measuring conditions:

$\Delta f \pm \frac{2}{3} \times \Delta f_{\text{max}}$; $f_{\text{mod}} = 1\text{kHz}$

20dB SINAD (CEPT) e.m.f.

1.0uV (0.7uV)

$\Delta F 60\% \times \Delta f_{\text{max}}$; $f_{\text{mod}} = 1\text{kHz}$.

Measured with psophometric filter.

Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$$420 - 440\text{MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

$$440.025 - 449.975\text{MHz: } f_x = \frac{F_s + 21.4}{9} \text{ MHz}$$

$$450 - 470\text{MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

Frequency Stability

Conforms with government regulations

Modulation Acceptance Bandwidth (EIA)

±7kHz (±7.5kHz)

Adjacent Channel Selectivity

EIA

75dB

CEPT

75dB

Spurious Rejection

EIA

85dB

Intermodulation Attenuation

EIA

70dB

CEPT

70dB (78dB)

Blocking

90dB/uV (100dB/uV)

Radiation

Conducted: max 0.8nW

Radiated: max. 0.8nW

AF Load Impedance (Loudspeaker)

4 ohm

AF Power Output

EIA: 3W (3.6W)

CEPT: 1.5W

AF Distortion

5% (1.5%)

 $\Delta f = 60\%$ Δf max., 1kHz, 1W, RF 1mVAudio Frequency Response, CEPT

+1/-3dB (+0/-1.5dB)

Relative to 1000Hz, -6dB/octave

fm: 300 - 3000Hz

Hum and Noise

Squelched : 80dB (better than 85dB)

Unsquelched : 55dB (60dB)

Squelch Recovery Time

100 ms (10 ms)

Squelch Attack Time, EIA

150 ms (110 ms)

Squelch Closing Time, EIA

150 ms (20 ms)

Current Consumption

Squelched: 150mA (130mA)

AF 2W : 500mA (450mA)

(1 channel, without tone equipment, 13.2V supply)

TRANSMITTER

RF Power Output

CQM5660-5W: 5W

CQM5660-20W: 20W

 $R_L = 50 \text{ ohm}$ Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s}{9}$$

Frequency Stability

Conforms with government regulations

Undesired Radiation

max. 0.2uW

Sideband Noise Power, CEPT

less than 70dB

AF Input Impedance

560 ohm

Modulation Sensitivity

70mV \pm 2dB

(60% Δ F max, 1kHz)

Modulation Response

300 - 3000Hz

+1/-3.0dB (+0.5/-2dB)

relative to 1000Hz, 6dB/octave

400 - 2700Hz

+1/-1.5dB (+0.5/-1dB) relative to 1000Hz,
6dB/octave

Modulation Distortion

fm = 1000Hz: max. 3%

Δ f = \pm 3.0kHz

fm = 300Hz: max. 5%

Δ f = \pm 0.9kHz

measured with 750u sec de-emphasis

FM Hum and Noise

70dB

CEPT (measured with 750 usec de-emphasis)
and psophometric filter.

Current Consumption

5W: less than 3.5A (2.5A)

20W: less than 6.0A (5.0A)

TECHNICAL SPECIFICATIONS

CQM5660

Guaranteed performance specifications unless otherwise noted.

Typical values are given in brackets.

GENERAL

Frequency Range

420 - 470MHz

Channel Separation

CQM5662: 30/25kHz

CQM5663: 20kHz

Maximum Frequency Deviation

CQM5662: ± 5 kHz

CQM5663: ± 4 kHz

Modulation Frequency Range

300 - 3000Hz

Maximum RF Bandwidth

RX: 3.0MHz

TX: 5.5MHz (CQM5662)

5.1MHz (CQM5663)

Antenna Impedance

50 ohm

Maximum Number of Channels

6

Supply Voltage

Minimum: 10.8V

Nominal: 13.2V

Maximum: 16.6V

Negative potential to chassis

Temperature Range

-30°C to $+60^{\circ}\text{C}$

Dimensions

B x D x H: 180 x 190 x 60mm

Weight

1.8 Kg

RECEIVER

Sensitivity

12dB SINAD (EIA), $\frac{1}{2}$ e. m. f.

0.4 μ V (0.3 μ V)

Measuring conditions:

$\Delta f \pm 2/3 \times \Delta f_{\text{max}}$; $f_{\text{mod}} = 1\text{kHz}$

20dB SINAD (CEPT) e. m. f.

1.0 μ V (0.7 μ V)

$\Delta F 60\% \times \Delta f_{\text{max}}$; $f_{\text{mod}} = 1\text{kHz}$.

Measured with psophometric filter.

Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$$420 - 440\text{MHz: } f_x = \frac{F_s + 21.4}{9} \text{ MHz}$$

$$440.025 - 449.975\text{MHz: } f_x = \frac{F_s \pm 21.4}{9} \text{ MHz}$$

$$450 - 470\text{MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

Frequency Stability

Conforms with government regulations

Modulation Acceptance Bandwidth (EIA)

±7kHz (±7.5kHz)

Adjacent Channel Selectivity

EIA

75dB

CEPT

75dB

Spurious Rejection

EIA

85dB

Intermodulation Attenuation

EIA

70dB

CEPT

70dB (78dB)

FTZ

70dB

Blocking

90dB/uV (100dB/uV)

Radiation

Conducted: max 0.8nW

Radiated: max. 0.8nW

AF Load Impedance (Loudspeaker)

4 ohm

AF Power Output

EIA: 3W (3.6W) - external speaker, 4 ohm

2W (2.4W) - internal speaker, 6 ohm

AF Distortion

5% (1.5%)

Δf=60% Δf max., 1kHz, 1W, RF 1mV

Audio Frequency Response, CEPT/FTZ

+1/-3dB (+0/-1.5dB)

Relative to 1000Hz, -6dB/octave

fm: 300 - 3000Hz

400 - 2700Hz 0/-1dB

Hum and Noise

Squelched : 80dB (better than 85dB)

Unsquelched : 55dB (60dB)

Squelch Recovery Time

250 ms (110 ms)

Squelch Attack Time, EIA

150 ms (50 ms)

Squelch Closing Time, EIA

150 ms (20 ms)

Current Consumption

Squelched: 150mA (130mA)

AF 2W : 500mA (450mA) - 4 ohm speaker

(1 channel, without tone equipment, 13.2V supply)

TRANSMITTERRF Power Output

CQM5660-5W: 5W

CQM5660-20W: 18W (20W)

 $R_L = 50 \text{ ohm}$ Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s}{9}$$

Frequency Stability

Conforms with government regulations

Undesired Radiation

max. less than 0.2uW

Sideband Noise Power, CEPT

less than 70dB

AF Input Impedance

560 ohm

Modulation Sensitivity

90mV \pm 3dB

(60% Δ F max, 1kHz)

Modulation Response

300 - 3000Hz

+1/-3.0dB (+0.5/-2dB)

relative to 1000Hz, 6dB/octave

400 - 2700Hz

+1/-1.5dB (+0.5/-1dB) relative to 1000Hz,
6dB/octave

Modulation Distortion

fm = 1000Hz: max. 3%

Δ f = \pm 3.0kHz

fm = 300Hz: max. 5%

Δ f = \pm 0.9kHz

measured with 750u sec de-emphasis

FM Hum and Noise

70dB

CEPT (measured with 750 usec de-emphasis)
and psophometric filter.

Current Consumption

5W: less than 1.5A (1.5A)

20W: less than 5.5A (5.0A)

GENERAL DESCRIPTION

CQM5660

The Sornophone 5000 is a mobile radiotelephone unit with self-contained controls and loudspeaker.

Although compact in size, it contains a transmitter/receiver, optional 5-tone sequential encoder/decoder or Channel Guard, and up to 6 transmit and receive channels.

A comparison of the various models are presented in the table below.

Type	CQM5662			CQM5663	
SPEC		5	20	5	20
Frequency Range	MHz	420 - 470		420 - 470	
RF Power	W	5	20	5	20
Channel Spacing	kHz	30/25		20	
Max. Number of Channels		6		6	

ACCESSORIES

Standard accessories include:

- Mounting frame
- Power cable
- Fist microphone with retainer or
- Fixed - mount microphone
- External loudspeaker
- External switches

MN5001

Mounting frame for mobile installations allowing the radio to be fixed in 36 positions. Includes a base plate with locking screw.

MN703

Desk stand for fixed installations.

MN704a

Mounting frame for mobile installations and direct attachment to the vehicle.

MC5001

Fist microphone with retractable spiral cable for mobile installation.

HS5001 Retainer for MC5001

HS5002 Retainer, with switches, for MC5001

MC704

Microphone with chockabsorbing mounting bracket for mobile installation.

MC703

Desk microphone with PTT (Push - to - Talk) switch for fixed installations.

MK5001

Installation kit containing connectors, power cable, fuses and fuseholders.

LS701

Loudspeaker enclosed in a plastic housing, complete with cable.

SU701

Transmitter keying switch for mounting on the steering column.

SU702

Transmitter keying switch for mounting on the dashboard.

Power Supply Units:

Equipment	220V AC	+24V DC
CQM5000, max. 5W	PS703	PS704
CQM5000, max. 20W	PS5001	PS702

MECHANICAL AND ELECTRICAL DESCRIPTION

The internal construction of CQM5000 is on an H-frame chassis with a shelf separating the receiver/transmitter (RF) printed circuit board and the various option printed boards. Front panel controls are an integral part of the printed board assemblies.

The chassis is a die cast aluminium frame comprising the left and right sides, the back, and a shelf located midway between the top and bottom. The chassis front is open and looks like an "H" viewed from the front.

Interconnection to the package exterior and to internal options are made via a System Interconnect Board located on the option side of the H-frame. A test connector is also located on the system board and is accessible from the rear of the radio.

This board also serves as channel switch unit in sets with multichannel option.

The moulded plastic front is directly attached to the chassis and has the speaker mounted to it. A separate moulded speaker grill and aluminium nameplate are attached to the front.

The top and bottom covers slide under the edge of the front and are then secured by screws at the rear.

The tone signalling encoder/decoder board (TQ) and the multifrequency board (XS) mount in the top section of the chassis. Their switches and push buttons mount directly to the boards and protrude through the front.

Thin casted shields with adjustment holes are placed over the transmitter and receiver oscillators and parts of the transmitter in order to reduce spurious radiation.

CIRCUIT DESCRIPTION

Receiver

The receiver circuitry is placed on the main board and can be divided into:

- Receiver front end
- 1st IF section with first and second oscillator.
- 455kHz 2nd IF portion with demodulator.

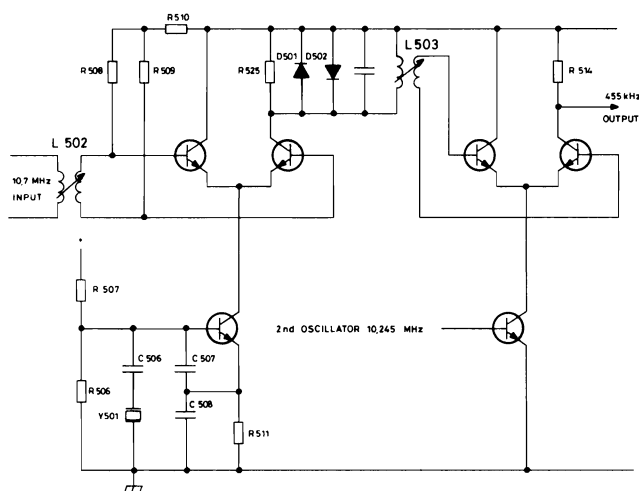
(refer to functional block diagram)

Front-End

The receiver front-end consists of a dual-resonator input filter, a transistor RF amplifier, Q401, a triple-resonator intermediate filter and a FET mixer, Q402. The drain of the FET is terminated in the first IF resonant circuit which adapts the output impedance to the crystal filter. The front-end, antenna relay, first mixer and part of the transmitter PA interconnections are design in micro-stripline techniques on the mainboard.

1st IF

The first IF frequency is 21.4MHz. The output from the crystal filter is fed to a dual-gate MOS-FET amplifier, Q501, the output signal of which is fed to the second mixer, U501, a single balanced, self-oscillating, active mixer. Out of the second mixer comes the 455kHz IF signal. Two diodes, D501-502, limit the output from the mixer.



455kHz IF/Demodulator

The selectivity of the 455kHz IF amplifier is formed by a ceramic filter fed from a 455kHz amplifier/impedance transforming stage. The final 455kHz amplification and limiting is performed by an integrated circuit, U502, which also contains the quadrature FM detector and the AF amplifier/output emitter follower for the audio line signal.

SQUELCH AND AUDIO CIRCUITS

Squelch

The audio line signal (Vol/Sq - HI) is fed to a selective amplifier stage, where noise (frequencies around 7kHz) is extracted from the audio signal. Via the squelch potentiometer R607, this signal reaches an expander stage which improves the level discrimination characteristics of the circuit. A passive voltage doubler circuit (D603-D604) with high source impedance performs the action of an average value rectifier. A Schmitt Trigger gives the necessary hysteresis and a well-defined output from the following buffer stage, Q605.

In the squelched condition and during transmissions this output is +1.5V and mutes the audio power amplifier. The transmit indicator is part of the muting function.

A push button switch, S601, cancels the squelch function, when depressed, by grounding the base of Q601.

AUDIO

In sets with Pilot tone option (CG), the audio line signal is fed to the Pilot tone board for filtering and back to the main board. In sets without CG this path is bypassed and the audio line signal is fed directly to the passive de-emphasis network R629-C608 followed by the volume control.

The volume control potentiometer R630 is mounted directly on the RF board and protrude through the front panel. The audio output amplifier U601 is a monolithic IC package capable of driving the loudspeaker at the desired power level. The output amplifier can be muted with a DC signal from the audio mute gate, which combines different logic signals to decide whether the amplifier should be active or not.

These inputs are:

- Regulated TX Voltage
- Squelch cancel
- Squelch signal

In sets equipped with Pilot tone and/or 5-tone sequential option, an RX mute function is routed from the option board to make the extra mute conditions possible.

The value of C610 in the feed back loop is chosen as the best compromise between battery ripple rejection and receiver squelch attack time.

The pilot lamp in the channel knob is supplied from A+, but controlled by the regulated 8.5V via transistor Q968.

TRANSMITTER

The transmitter consists of a modulation processor, an exciter, and a power amplifier, all assembled on the main board along with the receiver.

The exciter contains an FM oscillator, an audio processor, all frequency multiplier functions, and includes those stages operating at low enough power levels to avoid heat sinks. The exciter output is at the carrier frequency when applied to the power amplifier.

The power amplifier boosts the signal to the proper level, and includes a low pass filter for suppressing harmonics and a circuitry which permits adjustment of the operating power level. The PA low pass filter connects to the antenna relay via a stripline on the board.

Modulation processor

The signal from the microphone load R901 on the XS board is applied to amplifier U101b. The transmitter audio frequency response is shaped by the feedback network R104-R103-C104. The modulation limiting is obtained in the feedback network formed by D101, D102, R105, R106 and R107. The maximum permissible frequency deviation is set by R116 in single channel sets. In multichannel sets the potentiometer is turned up 2/3 and the deviation adjusted individually; refer to adjustment of XS5661 and XS5662.

Amplifier U101A is operated as an active lowpass splatter filter feeding the modulating input of the FM oscillator.

Exciter

The exciter takes the third harmonic of the crystal oscillator, filters it to reduce spurious signals and amplifies it. Four amplifier stages (Q201-2-3-4), of which Q202 is a frequency tripler, and four filters (L204-5-8-9) are used in a narrow band design which limits the maximum frequency spread of the transmitter. The exciter has four test points (TP201-2-3-4) for measurements and alignment.

Power Amplifier

The PA is constructed on the main board and employs two broadband untuned amplifier stages Q205, Q206. Two amplifier configurations are available providing options of power levels of 5 watts or 20 watts. A power control circuit is included to sense the output RF level and keep it constant with variations in temperature and supply voltage.

This circuit also limits the peak power to less than maximum, as specified by the authorities, while still maintaining the output as near maximum as possible.

The output power level can be set with a potentiometer, R215, over at least a 3:1 range. The transmitter delivers rated power into a 50-ohm load. A load SWR of 1.4:1 will result in more than 90% of the power being radiated. The transmitter will operate into a load with up to 3:1 SWR.

The power adjustment is achieved by controlling the supply voltage of power amplifier Q205 via transistor Q207. This series transistor is biased by a voltage generated by the feedback network C255, D210, Q210, Q209, Q208.

Oscillators

The oscillators are located on the main board for single frequency radio sets. All parts for the oscillators and compensation network are soldered to the board except the crystal which is a plug-in type.

A multifrequency board is required for more than one frequency channel. This board is available in two versions; one (XS5661) has space for accommodating two transmit and two receive channels; one (XS5112) has space for up to six channels and an option for selecting the channels by a 3-digit BCD signal binary converter, U901-U902. The BCD signal is applied to three pins in J911. Separate active circuitry is used for each oscillator and all have their outputs connected to two buffer amplifiers

Q927-Q967. The buffers' outputs are fed to their resonant circuit on the main board by a plug-in connection (J301-J151). The required oscillator is selected by switching the emitter of the oscillator transistor to the negative DC supply. The compensation voltage and audio for the oscillators is obtained from the same circuit on the main board via J902.

The maximum transmitter frequency deviation for the system is set by adjusting potentiometers, one for each channel, individually on each channel.

The oscillator uses a Colpitt's configuration with a bipolar transistor as the active element. The frequency is controlled by a third mode crystal which is operated at one third of the output frequency. This output frequency is selected by a tuned circuit in the transistor collector circuit. To provide modulation and compensation capability, the crystal, a variable inductor, and a varicap (variable capacitance diode) are connected in series. The inductor provides adjustment of the frequency to set the oscillator to the channel frequency. The varicap permits electrical adjustment of the frequency. Compensation voltage is generated by a resistor - thermistor network and applied to the varicap. A resistor in parallel with the crystal prevents oscillations with the crystal removed from the circuit.

Transmitter Oscillator

In the transmitter the circuit is used with the following additions. First, an inductor is placed across the crystal to resonate C_0 thus minimizing the audio distortion in the modulated output. Second, the audio voltage is superimposed on the compensating bias voltage to give the required deviation.

Receiver Oscillator

In the receiver the oscillator circuit has a buffer amplifier connected between the collector of the oscillator transistor and the tuned circuit, to provide the required power level. Transistor Q303 triples the frequency before it is applied to the mixer, Q402.

SUPPLY VOLTAGE DISTRIBUTION SYSTEM

The battery voltage (A + BATT) enters the radio via two pins of the rear system connector to the interconnect board. Both inputs are connected to reverse polarity protection diodes D901, D902. The ground lead comes through the same connector and is connected to chassis ground through a fusible printed wiring path which will open in case of the ground wire being accidentally connected to A +.

One battery input goes directly from the interconnect board via a feed-through capacitor and a connector P201 to the transmitter PA stages. The other input feeds through P903 to the main board for two functions. One branch for the audio amplifier passes through an RC-ripple filter R638 - C618 and one of the ON/OFF switch sections U602. The other section of the ON/OFF switch controls the $V_B +$ to the voltage regulator U602 consisting of a monolithic regulator. The regulator output is fixed at 8.5V by means of a factory adjusted resistor.

Regulated 8.5V is switched to either the receiver or the transmitter by the antenna relay. The antenna relay is also supplied by the 8.5V regulated.

The squelch circuit, the modulation processor and parts of the IF amplifier U502 is supplied directly from the continuous 8.5V.

The receiver front-end, the receiver oscillator, the 10.7MHz IF stages and the second oscillator are supplied from 8.5V RX.

The transmitter oscillator and the exciter are supplied from 8.5V TX.

In sets with 5-tone sequential option or Pilot tone, the PTT (Push to talk) lead runs through the option board to provide for correct tone keying function.

WARNING

The transmitter PA transistors contain Beryllia which is poisonous when absorbed by the human body. Dissection, filing, or grinding of these transistor may be hazardous.

GENERAL DESCRIPTION

CQM5660

The Stornophone 5000 is a mobile radiotelephone unit with self-contained controls and loudspeaker.

A comparison of the various models are presented in the table below.

Although compact in size, it contains a transmitter/receiver, optional 5-tone sequential encoder/decoder or Channel Guard, and up to 6 transmit and receive channels for CQM5662 and CQM5663, and 1 channel for CQM5664.

Type	CQM5662			CQM5663		CQM5664	
SPEC		5	20	5	20	5	20
Frequency Range	MHz	420 - 470		420 - 470		420 - 470	
RF Power	W	5	20	5	20	5	20
Channel Spacing	kHz	30/25		20		12.5	
Max. Number of Channels		6		6		1	

ACCESSORIES

Mounting frame	MC5001	Fist microphone with retractable spiral cable for mobile installation.
Power cable		
Fist microphone with retainer or Fixed - mount microphone	HS5001	Retainer for MC5001
External loudspeaker	HS5002	Retainer, with switches, for MC5001
External switches	MC5002	Cylindrical handmicrophone with build-in amplifier and press-to talk switch. Fitted with a coiled cord terminated into a connector which fits into the microphone retainer.
LS701 Loudspeaker enclosed in a plastic housing, complete with cable.		
MC702b Dynamic fist microphone with adjustable output level.	HS5003	Retainer for MC5002, without hook switch.
JB701a Junction box for MC702b. Consists of a plastic housing provided with cable for soldering assembly. Junction box is to be mounted behind the first microphone retainer.	HS5004	Retainer for MC5002, with hook switch.
MC703a Desk microphone with PTT (Push -to - Talk) switch for fixed installations.	MK5001	Installation kit containing connectors, power cable, fuses and fuseholders.
MC704 Microphone with shockabsorbing mounting bracket for mobile installation.	MN703	Desk stand for fixed installations.
MK704 Mounting kit consisting of 2 flexible tubes, used for mounting the MC704 in close-talk position.	MN704	Mounting bracket for the radio cabinet.
	MN5001	Mounting frame for mobile installations allowing the radio to be fixed in 36 positions. Includes a base plate with locking screw.

- MN5002 Mounting cassette for the radio cabinet (see mechanical layout).
- MT5001 Microphone with retainer. The retainer contains a microswitch which is used to switch off the internal loudspeaker, when the microphone is lifted.
- SU701 Transmitter keying switch for mounting on the steering column.

- SU702 Transmitter keying switch for mounting on the dashboard.
- SU704 Switch circuit for autoradio mounting.
- SU5003 External alarm with timer (Horn Alarm).

Equipment	220 V AC	+24 V DC
CQM5000, max. 5 W	PS703	PS704
CQM5000, max. 20 W	PS5001	PS702

MECHANICAL AND ELECTRICAL DESCRIPTION

The internal construction of CQM5000 is on an H-frame chassis with a shelf separating the receiver/transmitter (RF) printed circuit board and the various option printed boards. Front panel controls are an integral part of the printed board assemblies.

The chassis is a die cast aluminium frame comprising the left and right sides, the back, and a shelf located midway between the top and bottom. The chassis front is open and looks like an "H" viewed from the front.

Interconnection to the package exterior and to internal options are made via a System Interconnect Board located on the option side of the H-frame. A test connector is also located on the system board and is accessible from the rear of the radio.

This board also serves as channel switch unit

in sets with multichannel option.

The moulded plastic front is directly attached to the chassis and has the speaker mounted to it. A separate moulded speaker grill and aluminum nameplate are attached to the front.

The top and bottom covers slide under the edge of the front and are then secured by screws at the rear.

The tone signalling encoder/decoder board (TQ) and the multifrequency board (XS) mount in the top section of the chassis.

Their switches and push buttons mount directly to the boards and protrude through the front.

Thin casted shields with adjustment holes are placed over the transmitter and receiver oscillators and parts of the transmitter in order to reduce spurious radiation.

RECEIVER CIRCUIT DESCRIPTION

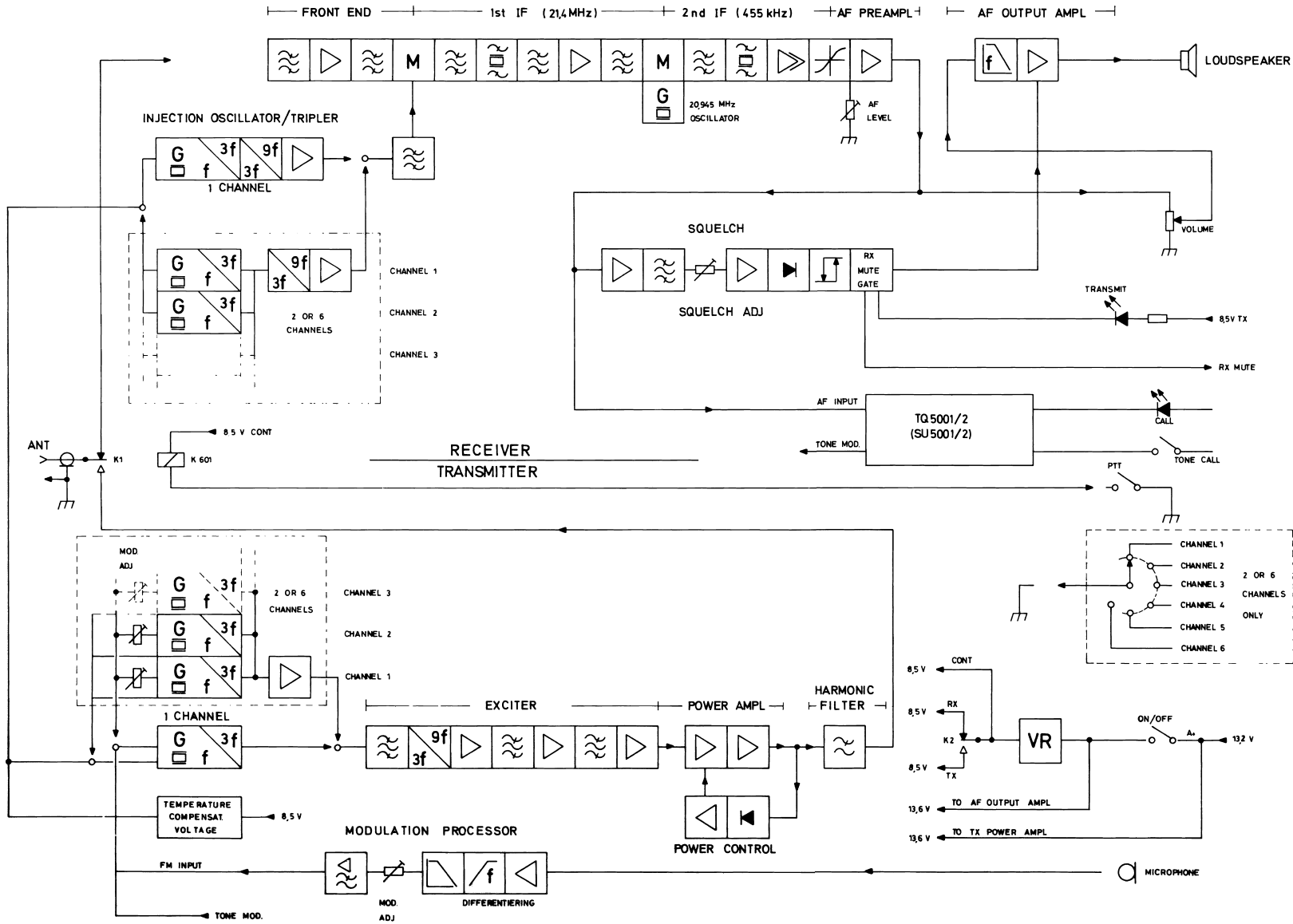
The receiver circuitry is placed on the main board and can be divided into:

- Receiver front end
- 1st IF section with first and second oscillator.
- 455 kHz 2nd IF portion with demodulator.

(refer to functional block diagram)

FRONT-END

The receiver front-end consists of a dual-resonator input filter, a transistor RF amplifier, Q401, a triple-resonator intermediate filter and a FET mixer, Q402. The drain of the FET is terminated in the first IF resonant circuit which adapts the output impedance to the crystal filter. The front-end, antenna relay, first mixer and part of the transmitter PA interconnections are design in micro-strip-line techniques on the mainboard.



FUNCTIONAL BLOCK DIAGRAM
CQM 5660

D402.673

CQM5660

ADJUSTMENT PROCEDURE

General

This adjustment procedure applies to the following radiotelephone types:

- CQM5662 - 30/25kHz Channel spacing
- CQM5663 - 20kHz Channel spacing

Before making adjustments to the radiotelephone transmitter/receiver, read the type label and note the channel frequencies. Check all straps according to the notes on the diagrams. Also check the selective calling tone equipment, if any, against the coding instructions; refer to description of tone equipment.

All screens must be in place and properly secured during the adjustments.

Measuring Instruments

The following list contains instruments necessary for adjusting the radiotelephone and checking its performance characteristics:

- DC Voltmeter $R_{in} \geq 1\text{Mohm}$
- AC Voltmeter $Z_{in} > 1\text{Mohm} // 50\text{pF}$
- Multimeter $R_i \geq 20\text{Kohm/Volt}$
- Distortion meter e.g. Storno E11c

Psophometric filter

- RF Watt meter 25 W/50 ohm/420-470MHz
- RF generator $Z_{out} = 50\text{ohm}; 470-470\text{MHz}$
- 21,4MHz signal gen. Crystal controlled
- Frequency counter with attenuator $Z_{in} = 50\text{ohm};$ sensitivity 100mV af 175MHz
- RF diode probe Storno 95. 0089-00
- RF coaxial probe Storno 95. 0179-00
- DC power supply 10.8 V - 16.6 V; 6A
- Oscilloscope 0 - 5 MHz min.
- Set of trimmingtools Storno 17. 0054

Miscellaneous

- 4 ohm/3W resistor 3 x Storno code 82. 5026
- 22 uF/40 V electrolytic capacitor Storno code 73. 5107-00
- Connector, 11-pin house Storno code 41. 5543-00
- Connector, 8-pin house Storno code 41. 5542-00
- Pins for connectors Storno code 41. 5551-00

RECEIVER ADJUSTMENTS

See D402.671 and D402.672 for location of components.

Checking 8.5 V regulated supply

Turn the power supply ON and set the voltage to 13.2 V. Set the power supply current limiter to 1A.

Turn the radiotelephone ON by depressing the ON/OFF button. Note the light in the Channel selector, if any, is on.

Depress the Squelch button.

Set the volume control to minimum.

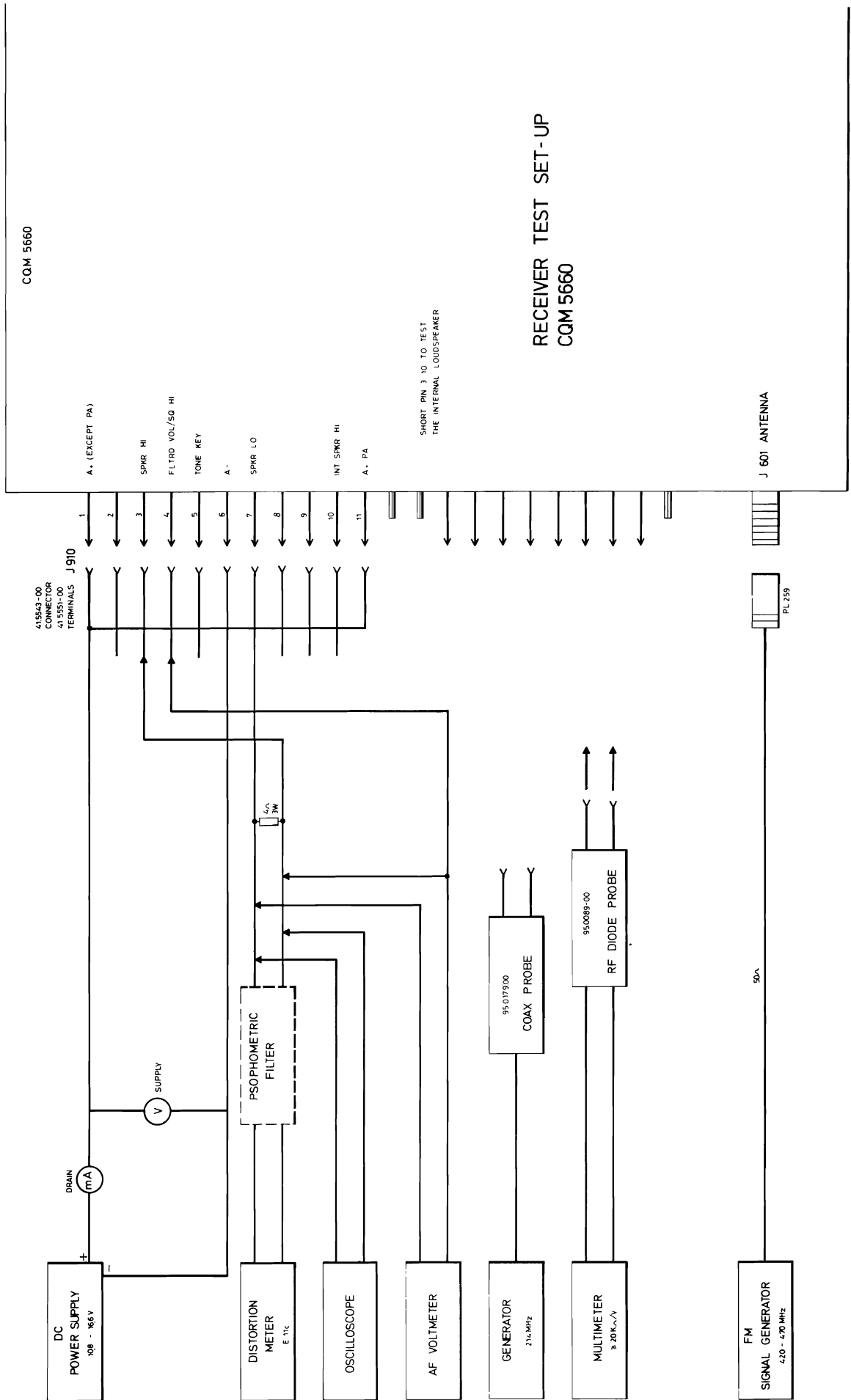
Connect the DC voltmeter to J 901 pin 3 and

read the voltage.

Requirement: 8.5 V ± 0.15 V

If the requirement is not fulfilled check resistor R636 against the colour code of U602.

U602 colour code	R636 Value in ohm
Brown	omit
Red	270
Orange	100
Yellow	47
Green	22
Blue	6.8



Adjust the power supply voltage to 16.6 V and read the 8.5 V regulated. Compare the change in the 8.5 volt regulated to the value obtained at 13.2 V.

Requirement: $\leq 50 \text{ mV}$

Repeat the procedure with the power supply adjusted for 10.8 V

Oscillator(s) and Frequency Multiplier

In single channel sets the receiver oscillator is located on the RF5660 board. In multichannel sets all oscillators are on the XS5661 board (2 Channels) or XS5662 (6 Channels).

Select the channel whose frequency is closest to center frequency. If not otherwise indicated adjustments should be performed on that channel.

Connect the leads of RF diode probe 95.0089-00 to the multimeter and select the most sensitive voltage range.

Connect the probe to J301 with the dot to the live terminal.

Single channel sets

Adjust L301 and L303 for maximum deflection

Multichannel sets

Adjust the following coils for maximum deflection:

L961, Channel 1
L962, Channel 2
L963, Channel 3
L964, Channel 4
L965, Channel 5
L966, Channel 6
L303, center channel

Connect the multimeter, 3V range, to TP301.

Adjust L303 and L305 for maximum deflection;
Typical 1 to 2 volts

Requirement: $\geq 0.6\text{V}$

Connect RF probe 95.0089-00 to TP401 with the dot to the live terminal.

Adjust C314, L307, and L308 for maximum. Repeat these adjustments until no further improvement is obtainable (3-4 times)

Receiver frequency adjustment

Connect coax probe 95.0179-00 to testpoint TP401.

Connect the frequency counter to the probe, and read the frequency.

The frequency is measured after the tripler and shall be $F_{\text{antenna}} \pm 21.4\text{MHz}$ as follows:

$$420-440 \text{ MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

$$440.025-449.975 \text{ MHz: } f_x = \frac{F_s + 21.4}{9} \text{ MHz}$$

$$450-470 \text{ MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

Single channel sets

Adjust L301 for the specified frequency ($9 \times f_x$)

This adjustment shall be performed at 25°C

Requirement: $F_{\text{nom}} \pm 100\text{Hz}$

Multichannel sets

Adjust the following coils on the XS board to the specified receiver frequencies ($9 \times f_x$)

L961, Channel 1
L962, Channel 2
L963, Channel 3
L964, Channel 4
L965, Channel 5
L966, Channel 6

Requirement: $F_{\text{nom}} \pm 100\text{Hz}$

IF Amplifiers

Connect a 21.4MHz signal generator to TP401 via coax probe 95.0179-00.

Connect RF diode probe 95.0089-00 with multimeter to test point TP501. (50uA range).

During adjustment the RF generator output must be kept low enough to prevent limiting in the IF stages, i.e. a maximum reading of 50uA on the multimeter.

Adjust coils L503, L502, L501, and L410, in that order, for maximum deflection on the multimeter.

Front-end

Connect RF probe 95.0089-00 and the multimeter to test point TP501. (50uA range).

Connect an unmodulated RF generator to the antenna connector, J601.

Set the generator frequency to the receiver frequency.

Adjust the generator output to produce a deflection on the multimeter, i.e. a maximum reading of 50uA on the multimeter.

Adjust L401 and L402 for maximum deflection.

Detune L406 as much as possible.

Adjust L405 and L407 for maximum deflection on the multimeter.

Adjust L406 for maximum deflection on the multimeter.

Remove the RF diode probe.

Standard Test condition:

Connect the RF generator to antenna generator and adjust the output to 1mV.

Modulate the RF generator with 1000Hz to 60% of ΔF max.

CQM5662: $\Delta F = \pm 3\text{kHz}$

CQM5663: $\Delta F = \pm 2.4\text{kHz}$

Connect a 4 ohm/3W resistor load to connector J910/3-7 (SPKR HI-SPKR LO).

Connect an AF voltmeter to J910/4-7 (FLTD VOL - SPKR LO).

IF demodulator

Turn R521 halfway up.

Adjust L504 for maximum reading on the AF voltmeter.

Connect a distortion meter and AF voltmeter across the 4 ohm resistor. (if Storno E11c distortion meter is used switch the function to AF voltmeter).

Adjust the volume control for approx. 2V across the load.

Switch the mode of E11c to measure distortion.

Adjust L501 and L410 for minimum distortion.

The demodulated signal may be monitored on an oscilloscope connected in parallel with the distortion meter.

Connect the AF voltmeter to J910/4-7 (FLTD VOL - SPKR LO).

Adjust R521 for a reading of 275mV on the AF voltmeter.

Requirement: $275\text{mV} \pm 5\text{mV}$.

Read the distortion.

Typical the Total Harmonic Distortion (THD) will be less than 5%.

Receiver Sensitivity, SINAD

EIA or CEPT method may be used.

Receiver sensitivity measurement EIA.

EIA (Electronic Industries Association) Standard, definition:

The SINAD sensitivity of a receiver is the minimum input signal that will provide at least 50% of the receiver's rated audio power with 12dB signal + noise + distortion to noise + distortion.

Method of measurement (CEPT).

The purpose of the measurement is to define the ratio of one condition to another.

The first condition is the one where a modulated RF-signal drives the receiver into full limiting. The audio output is measured with the distortion meter (in the CAL position) through a psophometric filter, and, disregarding the amplitude of the audio, this is adjusted to read 100% on the meter scale; this is our reference condition consisting of signal + noise + distortion, where 'signal' is the modulation of the RF, 'noise' is the lowest possible amount achieved from that particular receiver, when receiving a strong carrier, and 'distortion' is the modulation being slightly distorted in passing through the receiver.

The second condition is the one where the signal (modulation) is removed with a notch filter and the RF-signal is lowered in amplitude until the remaining noise and distortion increases to 20dB below the first condition, as read on the distortion meter scale. This corresponds to a reading of 10%, 10 being 20dB below 100, which was our reference condition.

In practice our first condition is achieved by feeding a minimum of 1000 uV of RF - signal modulated with 1000 Hz at 60% Δf max. to the receiver.

The audio output (which must be at least 50% of the receiver's audio rating) is measured through the psophometric filter, with the distortion meter in position CAL and adjusted with potentiometer ADJ. FSD. to a reading of 100.

The notch filter is then inserted in series with the audio by pressing one of the buttons marked in %. The meter needle immediately drops to indicate a low value, this being the receiver's inherent audio distortion.

By backing off the attenuator of the RF-generator thereby lowering the RF-input to the receiver, the noise will eventually increase; the attenuator is now adjusted for a 10% reading on the distortion meter scale.

At this stage it must be ensured that the increased noise and the signal (with the notch filter switched out while checking) still equals 100 on the meter scale.

The RF-generator's calibrated attenuator now shows the value of RF-signal required to achieve a 20dB ratio between signal + noise + distortion and noise + distortion, i. e. 20dB SINAD sensitivity.

EIA method

The EIA method differs from CEPT by omitting the psophometric filter and adjusting the RF generator for $2/3 \times \Delta f$ max. The SINAD sensitivity is measured as a 12dB ratio between signal + noise + distortion and noise + distortion, which corresponds to a reading of 25% noise + distortion.

Adjusting the sensitivity

Lower the RF generator output to obtain 20dB SINAD (10% THD as measured with the distortion meter). Readjust L402 for the best SINAD value, e. i. lowest generator output for 10% THD.

Measuring 20dB SINAD

Adjust the volume control for 2.45V as measured with an AF voltmeter and psophometric filter across the load.

Adjust the RF generator output to obtain 20dB SINAD condition.

Read the 20dB SINAD sensitivity

Requirement: $\leq 1.0\mu V$. e. m. f.

Measuring 12 dB SINAD

Adjust the volume control for 2.45V as measured with an AF voltmeter across the load.

Adjust the RF generator to obtain 12dB SINAD condition.

Read the 12dB SINAD sensitivity.

Requirement: $\leq 0.4\mu V$ ($\frac{1}{2}$ e. m. f)

The sensitivity should be measured on all channels, if more than one.

Audio Frequency Response

Set the signal generator to Standard Test Condition.

Adjust the volume control for 0.82V across the load. (4 ohm across (SPKR HI - LO)).

At 13,2V supply, $\Delta F = 60\% \Delta F$ max and 1000Hz measure the output voltage according to the following table:

	Frequency	Level	Tol.
Type CQM5662	300Hz	+9dB	+1dB/-3dB
	1000Hz	0dB	
	3000Hz	-9.5dB	+1dB/-3dB
Type CQM5663	300Hz	+10.5dB	+1.5dB/-3dB
	400Hz	+8dB	+1.5dB/-1.5dB
	1000Hz	0dB	
	2700Hz	-8.6dB	+1.5dB/-1.5dB
	3000Hz	-9.5dB	+1.5dB/-3dB
	6000Hz	<-20dB	

AF Power Output

Adjust the RF signal generator to Standard Test Condition.

Set the supply voltage to 13.2V.

Adjust the volume control for 3W output (3.46V across the 4 Ω load).

Measure the distortion (THD).

Requirement: THD ≤ 5%.

Squelch

Release the squelch cancel button.

Adjust potentiometer R607 SQUELCH ADJ. to open the receiver for an RF input signal corresponding to 8-10dB SINAD.

Current consumption

Measure the current consumption at 13.2V.

Requirements

Condition	1 channel	2 channels	6 channels
Standby	≤ 150 mA	≤ 160 mA	≤ 200mA
Receive 2W AF ~ 2,83V r. m. s. across 4 ohm.	≤ 500 mA	≤ 510 mA	≤ 550mA

For sets with selective calling facilities add the current consumption of the tone unit to the figures above.

TRANSMITTER ADJUSTMENTS

See D402.671 and D402.672 for location of components.

Adjust the power supply voltage to 13.2V and set current limiter as follows:

- 20W transmitter: 6A
- 5W transmitter: 4A

Refer to Receiver Alignment for measuring 8.5V regulated supply.

Preset all transmitter tuning slugs, L151, L153, L203, L204, C213, C215, C221, and C223, to be flush with the coil form top and all variable capacitors for minimum capacitance, i. e. plates fully open.

Connect a multimeter (1 volt range) to test point TP201.

Turn the power control potentiometer, R215, to minimum, anticlockwise (CCW).

Connect a Wattmeter, (25W) to the antenna connector, J601.

Oscillator adjustment

In single channel sets the transmitter oscillator is located on the RF5660 board. In multi-channel sets all oscillators are on the XS5661 board (2 channels) or XS5662 (6 channels). Select the channel whose frequency is closest

to the center frequency. If not otherwise indicated adjustments should be performed on that channel.

Key the Transmitter.

Single channel sets

Adjust L151 for maximum meter reading, typical 0.2V.

Multichannel sets

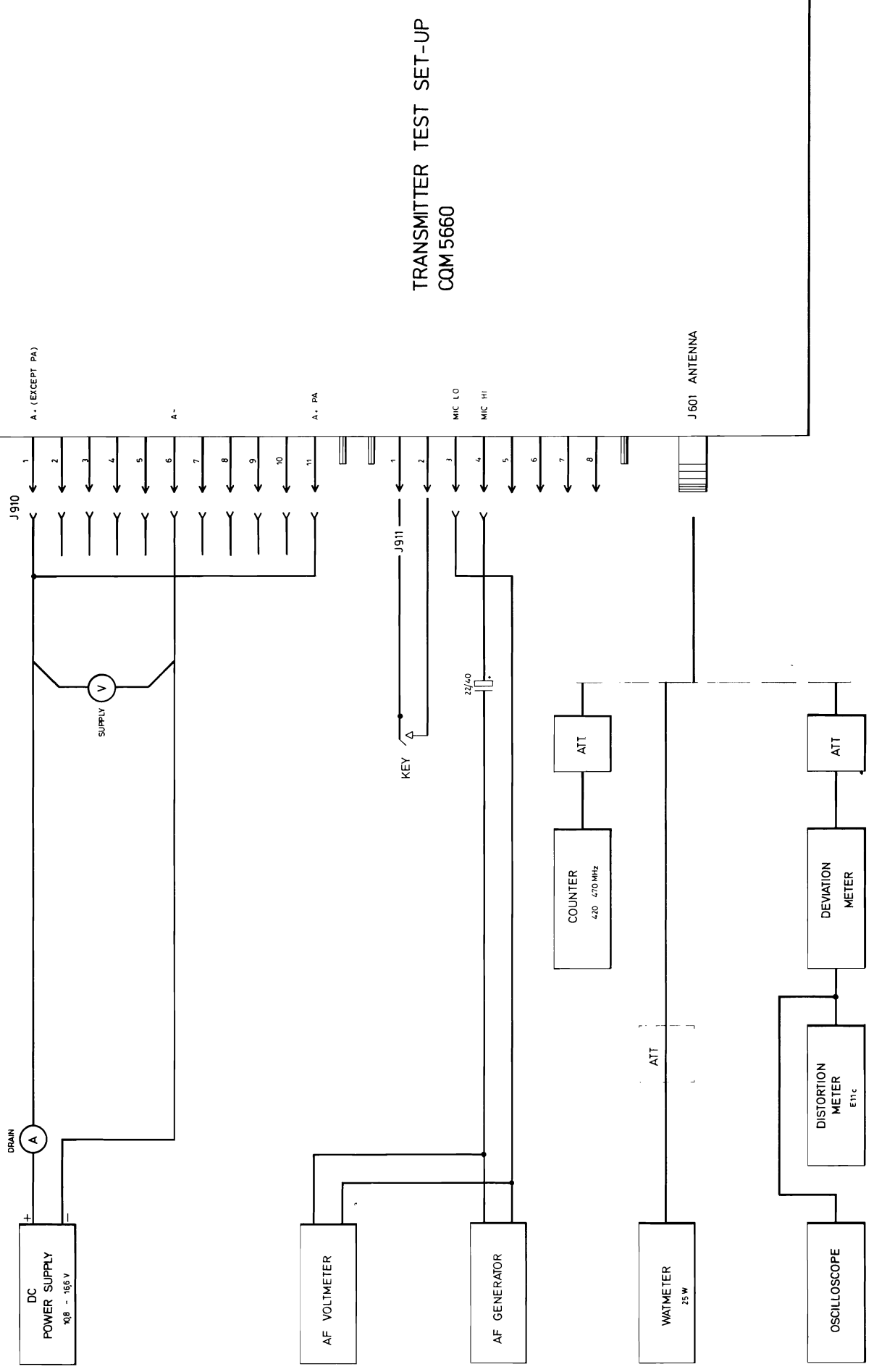
Adjust the following coils for maximum deflection on the multimeter, typical 0.2V.

- L921, channel 1
- L922, channel 2
- L923, channel 3
- L924, channel 4
- L925, channel 5
- L926, channel 6

Adjust L153 for maximum deflection on the multimeter. The increase in deflection is small and gently tuning is required. If the frequency is in the low end of the band it may be necessary to turn the slug of L151 (L921 - L926) partly into the coil form to obtain a multimeter deflection.

CQM 5660 UNDER TEST

TRANSMITTER TEST SET-UP
CQM 5660



Exciter, coarse adjustment

Connect a multimeter (1.0V range) to test point TP201.

Adjust L203 for minimum deflection. The dip is small

Connect the multimeter, (1V range) to test point TP202.

Adjust L204 for maximum deflection on the multimeter, typical 0.7V.

Repeat the adjustments of L203, L153, and L151 (L921-L926) until no further improvements is obtainable.

Adjust C213 for minimum reading. The dip is small.

Connect the multimeter, 1 volt range, to test point TP203.

Adjust C215 for maximum reading on the multimeter, typical 0.5V.

Repeat the adjustment of C213 and L204 until no further improvement is obtainable.

Adjust C221 minimum deflection. The dip is small and careful tuning is required.

Connect the multimeter, 10 volt range, to the RF probe.

Connect RF diode probe 95.0089-00 to TP204.

Adjust C221 and C223 for maximum deflection (typical 4.0V)

Adjust the PA power control, R215, for rated transmitter power, 5W or 20W.

Exciter, fine adjustment

Connect the multimeter to test point TP201.

Readjust L153 for maximum reading.

Connect the multimeter to test point TP202.

Peak L203 and L204 for maximum reading.

Connect the multimeter to test point TP203.

Peak C213 and C215 for maximum reading.

Connect the 95.0089-00 RF probe and multimeter to TP204.

Adjust C221 and C223 for maximum reading.

Typical Test point readings

TP201:	0.2V
TP202:	0.7V
TP203:	0.5V
TP204:	4.0V

Transmitter frequency adjustment

Connect a frequency counter through a suitable attenuator to the antenna connector J601.

Single channel sets

Adjust L151 to specified transmitter frequency.

Multichannel sets

Adjust the following coils on the XS board to the specified transmitter frequencies:

- L921, channel 1
- L922, channel 2
- L923, channel 3
- L924, channel 4
- L925, channel 5
- L926, channel 6

The frequency adjustment shall be performed at 25°C.

Requirement: $F_{nom} \pm 0.4 \text{ ppm}$. (180Hz at 450MHz)
 ppm= parts per million= $\times 10^{-6}$

RF power output, current consumption, and power control

Connect the Watt meter to the antenna connector, J601.

Increase the supply voltage to 16.6V. The voltage is measured directly at the input connector J910.

Readjust the PA power control, R215, for rated transmitter power (P), 5 or 20W.

The harmonic filter is factory adjusted and must not be touched.

Requirement: $P_{nom} \pm 0.1 \text{ dB}$.

Measure the RF power output at 16.6V, 13.2V and 10.8V.

Requirements (20W):

Voltage	Power	Current
16.6V	20W (ref)	$\leq 5.0 \text{ A}$
13.2V	$\geq 19 \text{ W}$	$\leq 5.0 \text{ A}$
10.8V	$\geq 15 \text{ W}$	$\leq 5.0 \text{ A}$

Voltage	Power	Current
16.6V	5.0W (ref)	$\leq 2.6 \text{ A}$
13.2V	$\geq 4.5 \text{ W}$	$\leq 2.6 \text{ A}$
10.8V	$\geq 4.2 \text{ W}$	$\leq 2.6 \text{ A}$

MODULATION ADJUSTMENTS

Set the power supply voltage to 13.2V.

Connect a deviation meter through an attenuator to the antenna connector, J601.

Connect a distortion meter and oscilloscope to the deviation meter output.

Connect a AF generator and an AF voltmeter to the microphone input via a 22uF capacitor; refer to test setup.

Adjust the AF generator output to 1 V r. m. s.

This voltage is approx. 20dB above the nominal modulation input level (60% Δf max) to ensure full limiting in the modulation processor.

Find the AF frequency between 200Hz and 3000Hz giving the greatest frequency deviation as read on the deviation meter with the transmitter keyed.

Check the maximum deviation for both positive and negative deviation polarity. At that audio frequency set the maximum frequency deviation Δf max with R116.

Type	Channel spacing	Δf max
CQM5662	30/25kHz	± 5 kHz
CQM5663	20kHz	± 4 kHz

Requirement

Difference between + and deviation: $\leq 10\%$

Multichannel sets

In multichannel sets R116 is turned 2/3 clockwise and the modulation adjustment is adjusted individually for each channel using the Δf max potentiometers on the XS board.

R956 = channel 1

R957 = channel 2

R958 = channel 3

R959 = channel 4

R960 = channel 5

R961 = channel 6

Modulation sensitivity and modulation distortion

Set the AF generator frequency to 1000Hz

Adjust the generator output until 60% of Δf max is obtained on the deviation meter.

CQM5662 : ± 3.0 kHz

CQM5663 : ± 2.4 kHz

Read the AF generator output and measure the modulation distortion on the audio output of the deviation meter.

Requirements:

Modulating signal: 70mV ± 2 dB

Distortion: $\leq 7\%$

(measured without de-emphasis)

Modulation frequency response

Set the AF generator to 1000Hz.

Reduce the AF generator output until a deviation of $0.2 \times \Delta f$ max is obtained on the deviation meter.

CQM5662 : ± 1.0 kHz

CQM5663 : ± 0.8 kHz

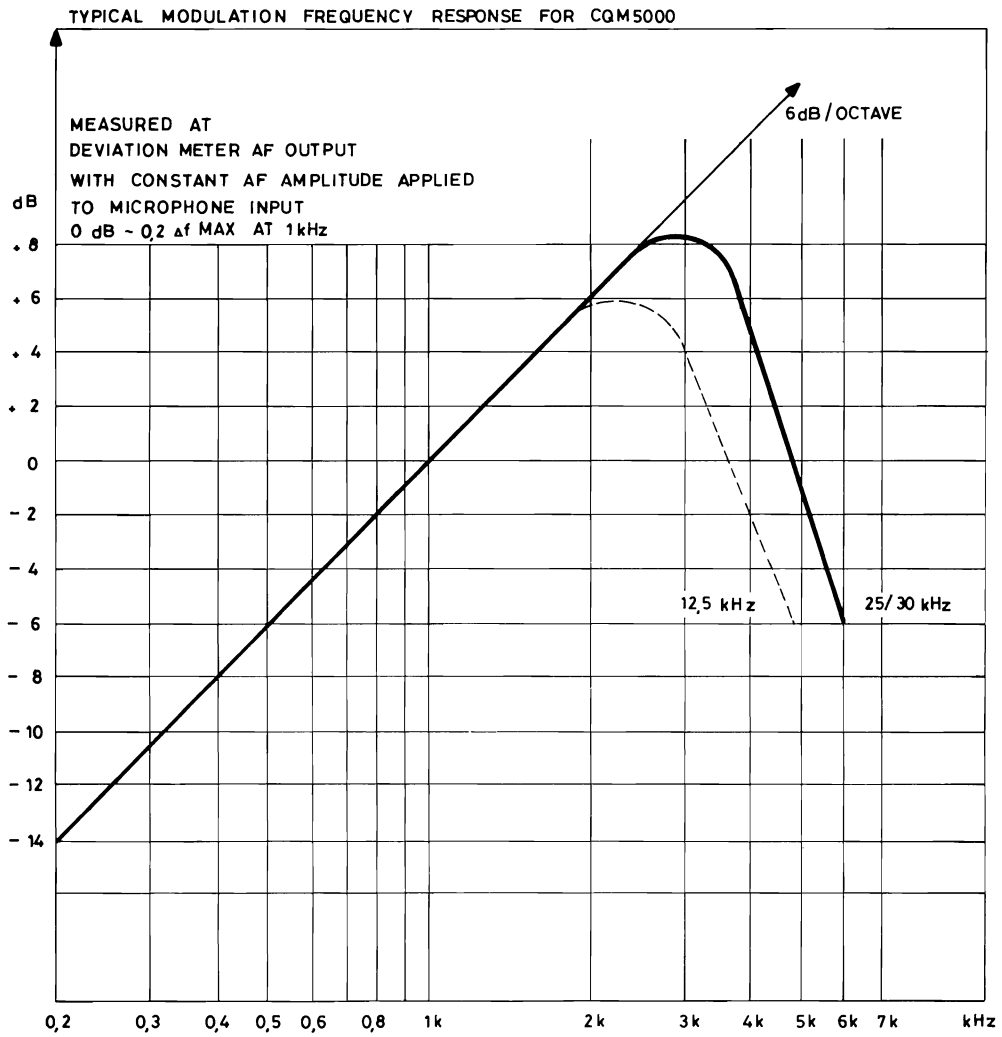
Vary the frequency of the generator and note the deviation changes as referred to the 1000Hz value.

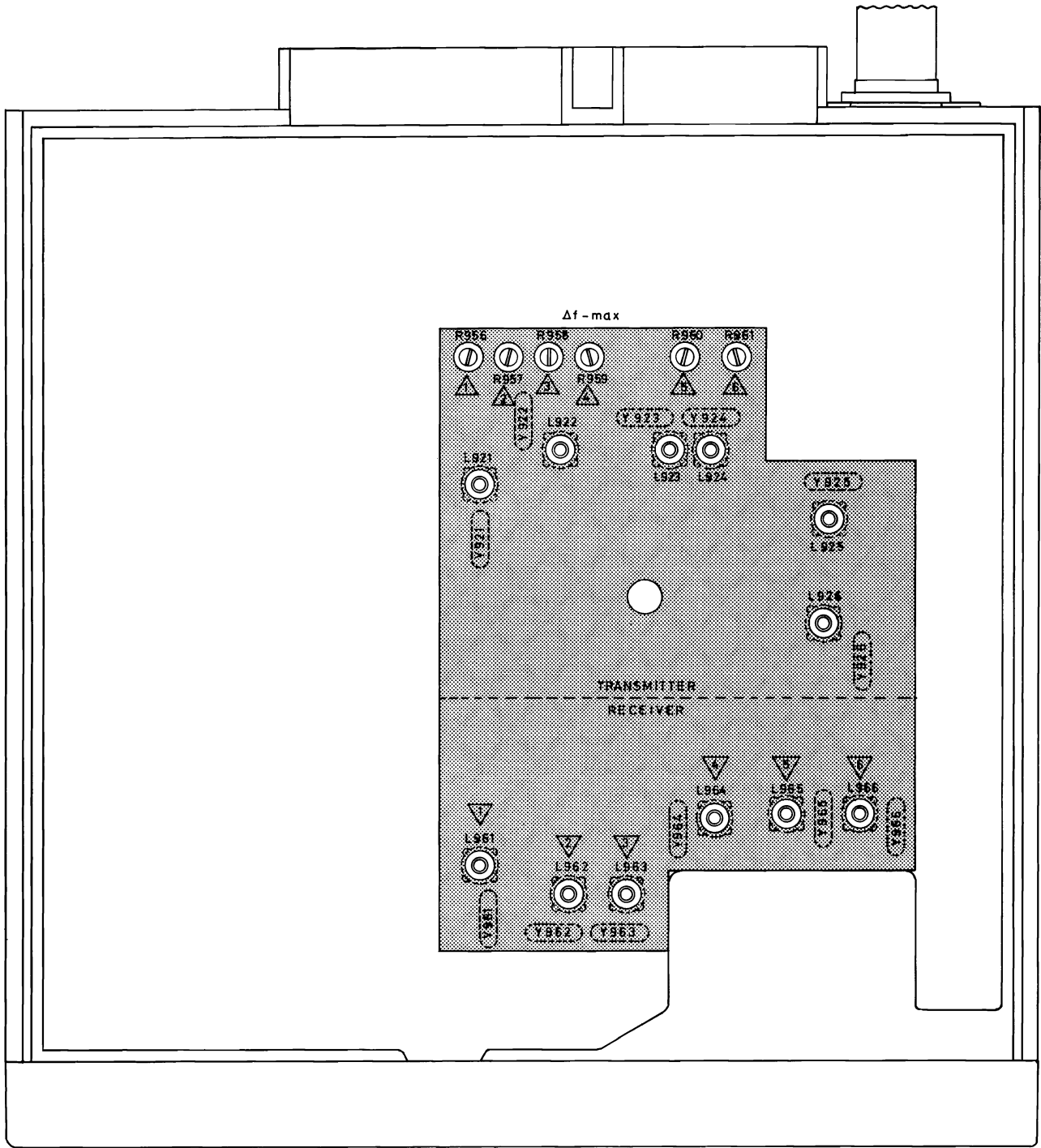
Requirement :

Within the frequency range 400-2700Hz

the frequency characteristic shall lie within +1dB/-1.5dB related to a 6dB/octave characteristic.

With 6kHz modulation frequency the deviation shall be attenuated 6dB below the 1kHz value.

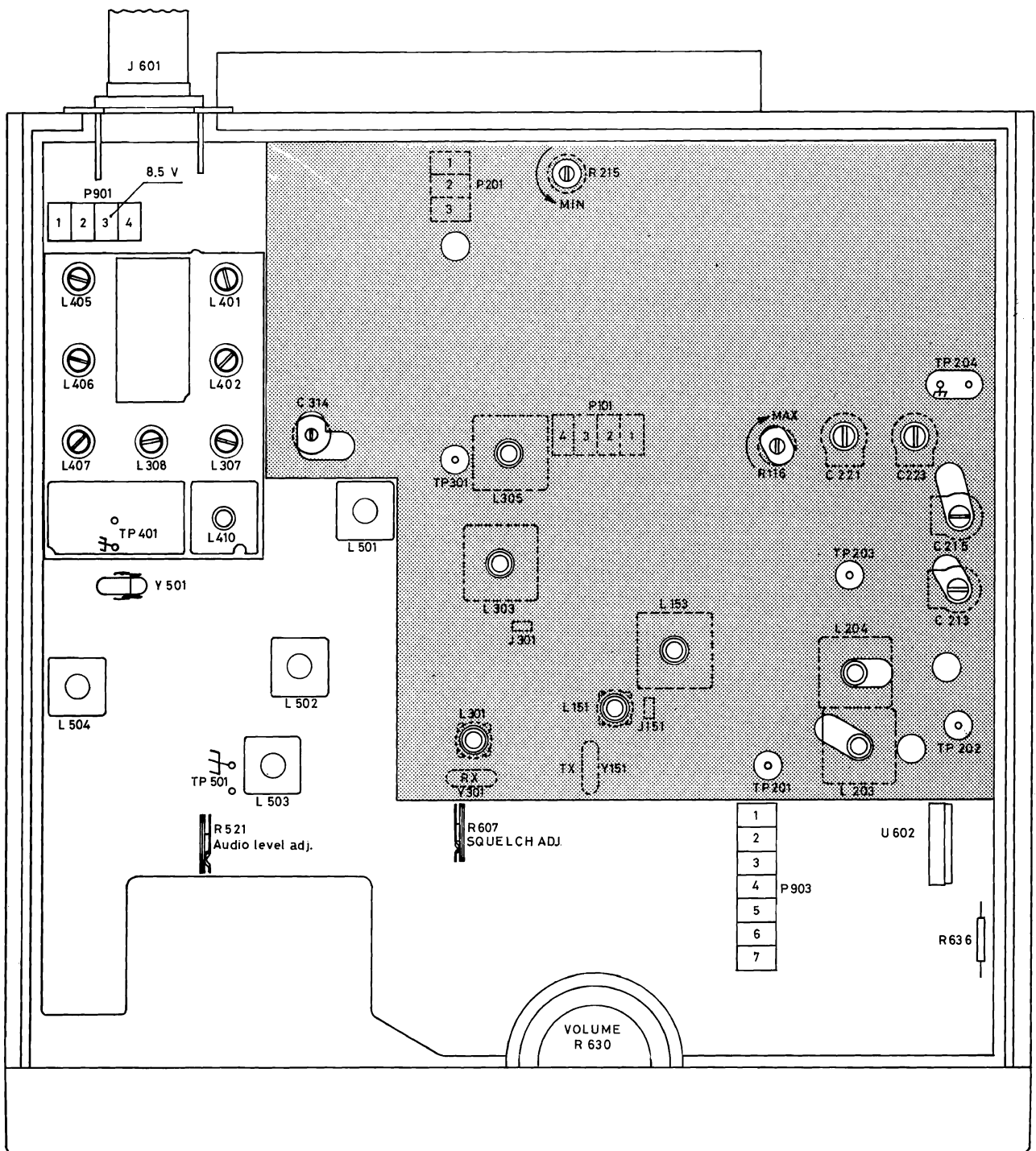




- ▽ = RECEIVER CHANNEL N°
- △ = TRANSMITTER CHANNEL N°

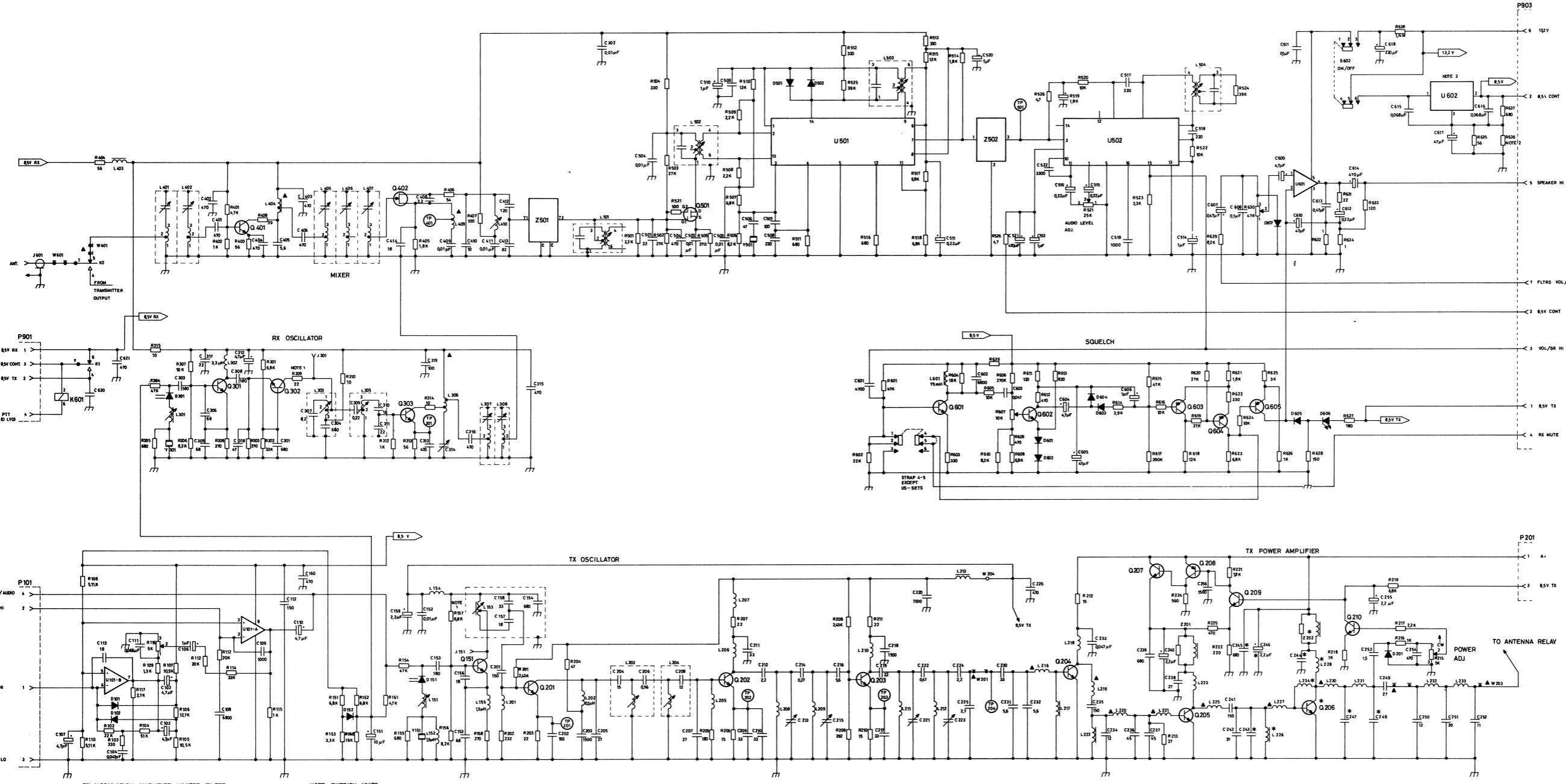
ADJUSTABLE COMPONENTS AND TEST POINTS ON XS5661/XS5662

D402.671



ADJUSTABLE COMPONENTS AND TEST
POINTS ON RF5660
& RF5550

D402.672/2



NOTES 1
TO MODIFY FOR MULTI FREQUENCY REMOVE
R157 (DISABLE TX OSC) AND R309 (DISABLE
RX OSC)

NOTE 2
VALUE OF R636 DEPENDS ON COLOR MARK
ON U602

U602	R636 VALUE Δ
BROWN	OMIT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	68

CAPACITOR VALUES PICOFARADS (EQUAL TO
MICROMICROFARADS) UNLESS FOLLOWED BY
UF = MICROFARADS. INDUCTANCE VALUES IN
NANOHENRYS UNLESS FOLLOWED BY UH =
MICROHENRYS, MH MILLIHENRYS.

* COMPONENT VALUES

COMP	20W	5W
C243	47pF	—
C244	27pF	—
C247	60pF	—
C248	10pF	8pF
L226	63UH	—
L228	YES	—
L234	YES	—
Q206	YES	—
Z202	YES	—
C245	680pF	—
C246	22UF	—

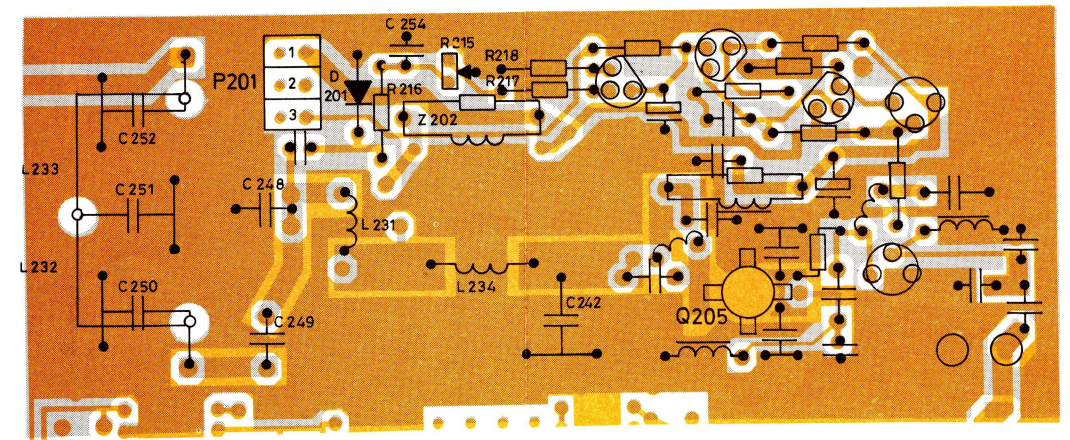
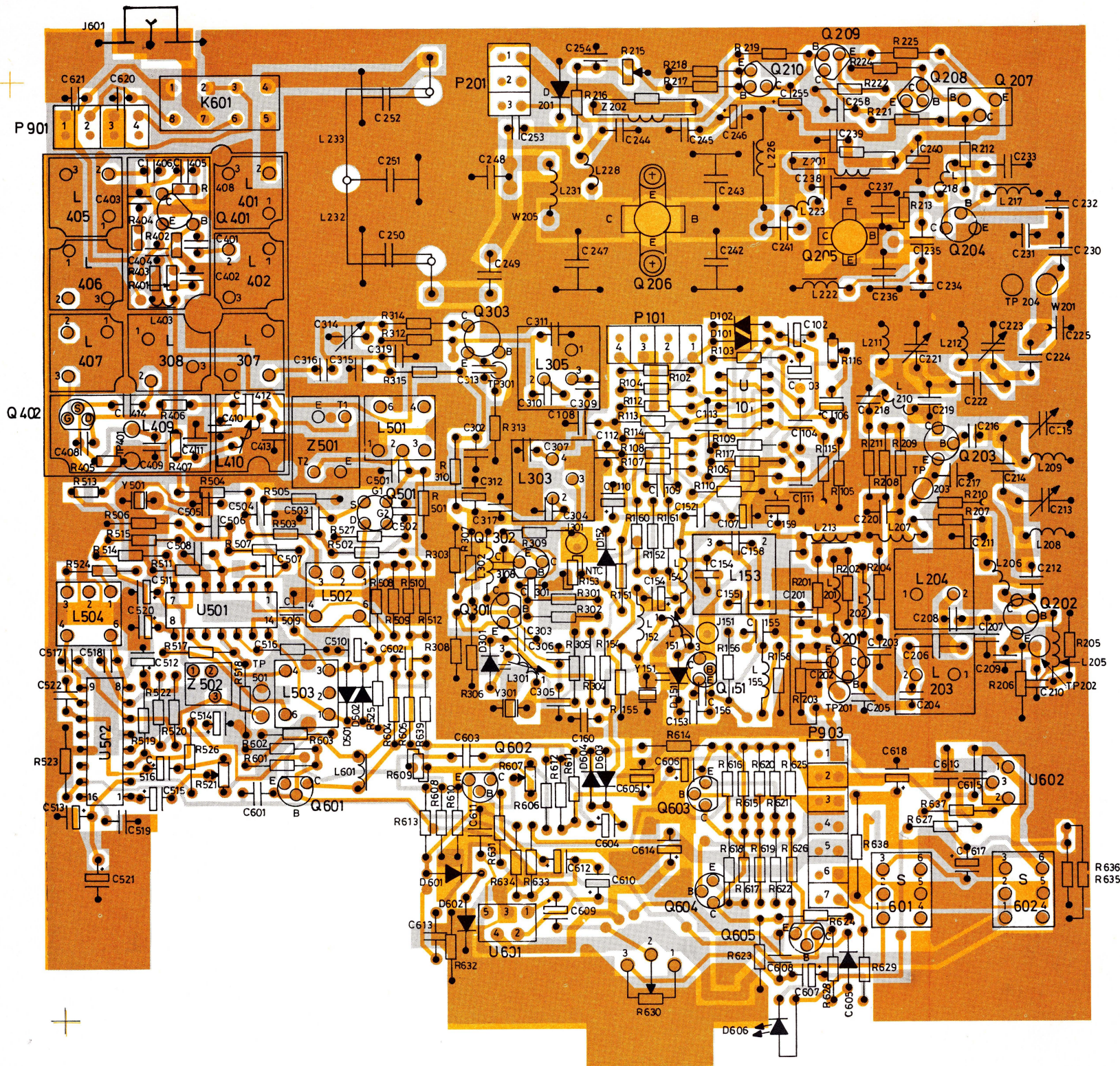
▲ PART OF PRINTED WIRE BOARD

RF UNIT RF 5660

D402.652/2

20W

5W



RF UNIT RF5660

D402.690

TYPE	Nº	CODE	DATA
	C102	73. 5172	4. 7uF 20% Tantal 35V
	C103	73. 5172	4. 7uF 20% Tantal 35V
	C104	76. 5142	47nF 5% Polyester FL 63V
	C106	73. 5170	1. 0uF 20% Tantal 35V
	C107	73. 5172	4. 7uF 20% Tantal 35V
	C108	76. 5140	6. 8nF 5% Polyester FL 50V
	C109	74. 5397	1nF 20% Ceram DI 50V
	C110	73. 5172	4. 7uF 20% Tantal 35V
	C111	76. 5151	68nF 5% Polyester FL 63V
	C112	74. 5392	150pF 20% Ceram DI 50V
	C151	73. 5173	10uF 20% Tantal 35V
	C152	76. 5135	10nF 10% Polyester FL 50V
	C153	74. 5386	180pF 5% Ceram DI 50V
	C154	74. 5396	680pF 20% Ceram DI 50V
	C155	74. 5405	68pF 5% Ceram DI 50V
	C156	74. 5403	18pF 5% Ceram DI 50V
	C157	74. 5374	18pF 5% Ceram DI 50V
	C158	74. 5377	33pF 5% Ceram DI 50V
	C159	73. 5171	2, 2uF 20% Tantal 35V
	C160	74. 5395	470pF 20% Ceram DI 50V
	C201	74. 5392	150pF 20% Ceram DI 50V
	C202	74. 5414	150pF 20% Ceram DI 500V
	C203	74. 5398	1. 5nF 20% Ceram DI 50V
	C204	74. 5373	15pF 5% Ceram DI 50V
	C205	74. 5376	27pF 5% Ceram DI 50V
	C206	79. 5005	0. 56pF 5% Phenolic TB 500V
	C207	74. 5376	27pF 5% Ceram DI 50V
	C208	74. 5372	12pF 5% Ceram DI 50V
	C209	74. 5377	33pF 5% Ceram DI 50V
	C210	74. 5377	33pF 5% Ceram DI 50V
	C211	74. 5377	33pF 5% Ceram DI 50V
	C212	74. 5413	2. 2pF 0. 1pF DI 100V
	C213	78. 5065	2/10pF Air trimmer 250V
	C214	79. 5002	0. 27pF 5% Phenolic TB 500V
	C215	78. 5065	2/10pF Air trimmer 250V
	C216	74. 5368	5. 6pF 0. 25pF Ceram DI 50V
	C217	74. 5377	33pF 5% Ceram DI 50V
	C218	74. 5398	1. 5nF 20% Ceram DI 50V
	C219	74. 5413	2. 2pF 0. 1pF DI 100V
	C220	74. 5398	1. 5nF 20% Ceram DI 50V
	C221	78. 5065	1/10pF Air trimmer 250V
	C222	79. 5004	0. 47pF 5% Phenolic TB 500V
	C223	78. 5065	2/10pF Air trimmer 250V
	C224	74. 5413	2. 2pF 0. 1pF DI 100V
	C225	74. 5364	2. 7pF 0. 25pF Ceram DI 50V
	C226	74. 5395	470pF 20% Ceram DI 50V
	C230	74. 5377	33pF 5% Ceram DI 50V

TYPE	Nº	CODE	DATA
	C231	74. 5368	5. 6pF 0. 25pF Ceram DI 50V
	C232	74. 5368	5. 6pF 0. 25pF Ceram DI 50V
	C233	76. 5139	47nF 10% Polyester FL 50V
	C234	74. 5372	12pF 5% Ceram DI 50V
	C235	74. 5414	150pF 20% Ceram DI 500V
	C236	75. 5038	45pF 5% Mica 250V
	C237	75. 5038	45pF 5% Mica 250V
	C238	74. 5376	27pF 5% Ceram DI 50V
	C239	74. 5396	680pF 20% Ceram DI 50V
	C240	73. 5171	2. 2uF 20% Tantal 35V
	C241	74. 5414	150pF 20% Ceram DI 500V
20W	C242	75. 5037	26pF 2% Teflon 250V
20W	C243	75. 5039	49pF 2% Teflon 250V
20W	C244	74. 5376	27pF 5% Ceram DI 50V
20W	C245	74. 5396	680pF 20% Ceram DI 50V
20W	C246	73. 5171	2. 2uF 20% Tantal 35V
20W	C247	75. 5041	60pF 2% Mica 250V
5W	C248	75. 5023	8pF 0. 5pF Teflon 250V
20W	C248	75. 5033	10pF 0. 5pF Teflon 250V
	C249	74. 5415	27pF 5% Ceram DI 500V
	C250	75. 5034	12pF 0. 5pF Teflon 250V
	C251	75. 5036	20pF 0. 5pF Teflon 250V
	C252	75. 5035	11pF 0. 5pF Teflon 250V
20W	C253	74. 5361	1. 5pF 0. 25pF Ceram DI 50V
	C254	74. 5395	470pF 20% Ceram DI 50V
	C255	73. 5171	2. 2uF 20% Tantal 35V
	C256	74. 5398	1. 5nF 20% Ceram DI 50V
	C301	74. 5396	680pF 20% Ceram DI 50V
	C302	76. 5135	10nF 10% Polyester FL 50V
	C303	74. 5386	180pF 5% Ceram DI 50V
	C304	74. 5396	680pF 20% Ceram DI 50V
	C305	74. 5405	68pF 5% Ceram DI 50V
	C306	74. 5403	18pF 5% Ceram DI 50V
	C307	74. 5370	8. 2pF 5% Ceram DI 50V
	C308	74. 5386	180pF 5% Ceram DI 50V
	C309	79. 5007	0. 82pF 5% Phenolic TB 500V
	C310	74. 5374	18pF 5% Ceram DI 50V
	C311	74. 5375	22pF 5% Ceram DI 50V
	C312	73. 5171	2. 2uF 20% Tantal 35V
	C313	74. 5395	470pF 20% Ceram DI 50V
	C314	78. 5068	1. 8/10pF Teflon trimmer 300V

RF UNIT RF5660

X402. 687

TYPE	Nº	CODE	DATA
	C315	74. 5395	470pF 20% Ceram DI 50V
	C316	74. 5395	470pF 20% Ceram DI 50V
	C317	74. 5375	22pF 5% Ceram DI 50V
	C318	74. 5379	47pF 5% Ceram DI 50V
	C319	74. 5391	100pF 20% Ceramic DI 50V
	C401	74. 5395	470pF 20% Ceram DI 50V
	C402	74. 5395	470pF 20% Ceram DI 50V
	C403	74. 5395	470pF 20% Ceram DI 50V
	C404	74. 5395	470pF 20% Ceram DI 50V
	C405	74. 5368	5. 6pF 0. 25pF Ceram DI 50V
	C406	74. 5395	470pF 20% Ceram DI 50V
	C408	74. 5365	3. 3pF 0. 25pF Ceram DI 50V
	C409	75. 5135	10nF 10% Polyester FL 50V
	C410	74. 5371	10pF 5% Ceram DI 50V
	C411	76. 5135	10nF 10% Polyester FL 50V
	C412	74. 5414	120pF 5% Ceram DI 50V
	C413	74. 5382	82pF 5% Ceram DI 50V
	C414	74. 5374	18pF 5% Ceram DI 50V
	C501	74. 5375	22pF 5% Ceram DI 50V
	C502	74. 5395	470pF 20% Ceram DI 50V
	C503	76. 5135	10nF 10% Polyester FL 50V
	C504	76. 5135	10nF 10% Polyester FL 50V
	C505	76. 5135	10nF 10% Polyester FL 50V
	C506	74. 5379	47pF 5% Ceram DI 50V
	C507	74. 5383	100pF 5% Ceram DI 50V
	C508	74. 5387	220pF 5% Ceram DI 50V
	C509	76. 5133	4. 7nF 10% Polyester FL 50V
	C510	73. 5170	1. 0uF 20% Tantal 35V
	C511	73. 5168	0. 22uF 20% Tantal 35V
	C512	73. 5170	1. 0uF 20% Tantal 35V
	C513	73. 5170	1. 0uF 20% Tantal 35V
	C514	73. 5170	1. 0uF 20% Tantal 35V
	C515	73. 5168	0. 22uF 20% Tantal 35V
	C516	73. 5168	0. 22uF 20% Tantal 35V
	C517	74. 5393	220pF 20% Ceram DI 50V
	C518	74. 5393	220pF 20% Ceram DI 50V
	C519	74. 5397	1nF 20% Ceram DI 50V
	C520	73. 5170	1. 0uF 20% Tantal 35V
	C521	73. 5166	470uF -10 +100% Elco 16V
	C522	76. 5132	3. 3nF 10% Polyester FL 50V
	C601	76. 5133	4. 7nF 10% Polyester FL 50V
	C602	76. 5134	6. 8nF 10% Polyester FL 50V
	C603	76. 5139	47nF 10% Polyester FL 50V
	C604	73. 5172	4. 7uF 20% Tantal 35V
	C605	73. 5164	47uF -10 +100% Elco 16V
	C606	73. 5170	1. 0uF 20% Tantal 35V
	C607	73. 5169	0. 47uF 20% Tantal 35V
	C608	76. 5144	0. 1uF 10% Polyester FL 63V

TYPE	Nº	CODE	DATA
	C609	73. 5172	4. 7uF 20% Tantal 35V
	C610	73. 5175	47uF 20% Tantal 6. 3V
	C611	76. 5144	0. 1uF 10% Polyester FL 63V
	C612	73. 5168	0. 22uF 20% Tantal 35V
	C613	76. 5148	0. 47uF 10% Polyester FL 63V
	C614	73. 5166	470uF -10 +100% Elco 16V
	C615	76. 5143	68nF 10% Polyester FL 63V
	C616	76. 5143	68nF 10% Polyester FL 63V
	C617	73. 5164	47uF -10 +100% Elco 16V
	C618	73. 5165	220uF -10 +100% Elco 25V
	C620	74. 5395	470pF 20% Ceram DI 50V
	C621	74. 5395	470pF 20% Ceram DI 50V
	D101	99. 5237	1N4148 Diode
	D102	99. 5237	1N4148 Diode
	D151	99. 5341	Cap. diode
	D152	99. 5237	1N4148 Diode
	D201	99. 5237	1N4148 Diode
	D301	99. 5341	Cap. diode
	D501	99. 5237	1N4148 Diode
	D502	99. 5237	1N4148 Diode
	D601	99. 5237	1N4148 Diode
	D602	99. 5237	1N4148 Diode
	D603	99. 5237	1N4148 Diode
	D604	99. 5237	1N4148 Diode
	D605	99. 5237	1N4148 Diode
	D606	99. 5303	1. 6V LED/RD 20mA
	J151	41. 5229	Socket
	J301	41. 5229	Socket
	J601	41. 5165	Connector UHF
	K601	58. 5085	2121 Relay 12V
	L151	61. 5034	RF coil
	L152	61. 5030	1. 5uH 10% HF choke 800mA
	L153	61. 5033	RF coil
	L154	61. 5031	10uH 10% HF choke 300mA
	L155	61. 5030	1. 5uH 10% HF choke 800mA
	L201	61. 5029	1. 0uH 10% HF choke 650mA
	L202	61. 5028	0. 1uH 10% HF choke 1. 3A
	L203	61. 5035	RF coil
	L204	61. 5035	RF coil
	L205	61. 5029	1. 0uH 10% HF choke 650mA
	L206	62. 1001	RF coil
	L207	61. 1383	RF choke

RF UNIT RF5660

X402. 687

TYPE	Nº	CODE	DATA
	L208	62. 0999	RF coil
	L209	62. 0998	RF coil
	L210	62. 1002	RF coil
	L211	62. 0999	RF coil
	L212	62. 0999	RF coil
	L213	61. 1383	RF choke
	L217	61. 1383	RF choke
	L218	62. 1002	RF coil
	L222	61. 1383	RF choke
	L223	62. 1000	RF coil
20W	L226	61. 5044	6.3uH 10% HF choke 400mA
20W	L228	62. 1000	RF coil
5W	L228	62. 1000	RF coil
	L231	62. 0997	Strap
	L232	62. 0996	RF coil, L233 incl.
	L234	62. 1003	Strap inductance
5W	L301	61. 5034	RF coil
	L302	61. 5015	3.3uH 10% HF choke 700mA
	L303	61. 5046	RF coil
	L305	61. 5045	RF coil
	L307	61. 1409	Helical coil
	L308	61. 1409	Helical coil
	L401	61. 1409	Helical coil
	L402	61. 1409	Helical coil
	L403	61. 1411	RF choke
	L405	61. 1409	Helical coil
	L406	61. 1409	Helical coil
	L407	61. 1410	Helical Coil
	L410	61. 5050	RF coil
	L501	61. 5027	21.4MHz IF transformer
	L502	61. 5027	21.4MHz IF transformer
	L503	61. 5025	455kHz IF transformer
	L504	61. 5025	455kHz IF transformer
	L601	61. 5023	75mH Choke 10mA
	P201	41. 5545	Fem. connector 3 pin
	P901	41. 0238	Modified connector
	P903	41. 0230	Fem. connector 7 pin
	Q151	99. 5347	PN2369 Transistor
	Q201	99. 5348	RF transistor 0.4W
	Q202	99. 5355	RF transistor 0.4W
	Q203	99. 5348	RF transistor 0.4W
	Q204	99. 5354	RF transistor 0.8W
	Q205	99. 5357	RF power transistor 5.5W
20W	Q206	99. 5358	RF power transistor 28W
	Q207	99. 5345	BD201 Transistor
	Q208	99. 5251	BC307 transistor
	Q209	99. 5121	BC237 transistor
	Q210	99. 5121	BC237 transistor

TYPE	Nº	CODE	DATA
	Q301	99. 5347	PN2369 Transistor
	Q302	99. 5347	PN2369 Transistor
	Q303	99. 5356	BFW92 Transistor
	Q401	99. 5290	BFR34 transistor
	Q402	99. 5245	2N5245 J-FET
	Q501	99. 5291	3N205 MOS-FET
	Q601	99. 5143	BC238 transistor
	Q602	99. 5201	BC239 transistor
	Q603	99. 5115	BC309 transistor
	Q604	99. 5115	BC309 transistor
	Q605	99. 5115	BC309 transistor
	R102	80. 5265	22Kohm 5% Carbon film 1/8W
	R103	80. 5243	330ohm 5% Carbon film 1/8W
	R104	80. 5095	51Kohm 5% Carbon film 1/8W
	R105	89. 5083	10.5Kohm 1% Metal film 1/4W
	R106	89. 5085	12.7Kohm 1% Metal film 1/4W
	R107	89. 5083	10.5Kohm 1% Metal film 1/4W
	R108	89. 5082	5.11Kohm 1% Metal film 1/4W
	R109	89. 5091	1.3Kohm 5% Carbon film 1/8W
	R110	89. 5082	5.11Kohm 1% Metal film 1/4W
	R112	89. 5086	20Kohm 1% Metal film 1/4W
	R113	89. 5084	12.4Kohm 1% Metal film 1/4W
	R114	89. 5087	32.4Kohm 1% Metal film 1/4W
	R115	80. 5249	1Kohm 5% Carbon film 1/8W
	R116	86. 5078	5Kohm 10% Carbon pot. 0.5W
	R117	80. 5254	2.7Kohm 5% Carbon film 1/8W
	R151	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R152	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R153	89. 5088	3.3Kohm 10% NTC 0.5W
	R154	80. 5269	47Kohm 5% Carbon film 1/8W
	R155	80. 5247	680ohm 5% Carbon film 1/8W
	R156	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R157	80. 5261	10Kohm 5% Carbon film 1/8W
	R158	80. 5242	270ohm 5% Carbon film 1/8W
	R160	80. 5263	15Kohm 5% Carbon film 1/8W
	R161	80. 5257	4.7Kohm 5% Carbon film 1/8W
	R201	89. 5098	2.43Kohm 1% Metal film 1/4W
	R202	89. 5099	232ohm 1% Metal film
	R203	80. 5229	22ohm 5% Carbon film 1/8W
	R204	80. 5233	47ohm 5% Carbon film 1/8W
	R205	80. 5240	180ohm 5% Carbon film 1/8W

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TYPE	Nº	CODE	DATA
	R206	80. 5227	15ohm 5% Carbon film 1/8W
	R207	80. 5229	22ohm 5% Carbon film 1/8W
	R208	89. 5098	2.43Kohm 1% Metal film 1/4W
	R209	89. 5097	392ohm 1% Metal film 1/4W
	R210	80. 5227	15ohm 5% Carbon film 1/8W
	R211	80. 5229	22ohm 5% Carbon film 1/8W
	R212	80. 5227	15ohm 5% Carbon film 1/8W
	R213	89. 5100	27ohm 5% Carbon comp. 1/4W
	R215	86. 5078	5Kohm 10% Carbon pot. 0.5W
	R216	80. 5249	1Kohm 5% Carbon film 1/8W
	R217	80. 5253	2.2Kohm 5% Carbon film 1/8W
	R218	80. 5249	1Kohm 5% Carbon film 1/8W
	R219	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R221	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R222	80. 5241	220ohm 5% Carbon film 1/8W
	R224	80. 5246	560ohm 5% Carbon film 1/8W
	R225	80. 5245	470ohm 5% Carbon film 1/8W
	R301	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R302	80. 5255	3.3Kohm 5% Carbon film 1/8W
	R303	80. 5242	270ohm 5% Carbon film 1/8W
	R304	80. 5269	47Kohm 5% Carbon film 1/8W
	R305	80. 5247	680ohm 5% Carbon film 1/8W
	R306	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R307	80. 5261	10Kohm 5% Carbon film 1/8W
	R308	80. 5242	270ohm 5% Carbon film 1/8W
	R309	80. 5229	22ohm 5% Carbon film 1/8W
	R310	30. 5225	10ohm 5% Carbon film 1/8W
	R312	80. 5249	1Kohm 5% Carbon film 1/8W
	R313	80. 5234	56ohm 5% Carbon film 1/8W
	R314	80. 5225	10ohm 5% Carbon film 1/8W
	R315	80. 5225	10ohm 5% Carbon film 1/8W
	R401	80. 5257	4.7Kohm 5% Carbon film 1/8W
	R402	80. 5249	1Kohm 5% Carbon film 1/8W
	R403	80. 5234	56ohm 5% Carbon film 1/8W
	R404	80. 5234	56ohm 5% Carbon film 1/8W
	R405	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R406	80. 5234	56ohm 5% Carbon film 1/8W
	R407	80. 5237	100ohm 5% Carbon film 1/8W
	R408	80. 5232	39ohm 5% Carbon film 1/8W
	R501	80. 5253	2.2Kohm 5% Carbon film 1/8W
	R502	80. 5266	27Kohm 5% Carbon film 1/8W
	R503	80. 5266	27Kohm 5% Carbon film 1/8W
	R504	80. 5243	330ohm 5% Carbon film 1/8W
	R505	80. 5242	270ohm 5% Carbon film 1/8W
	R506	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R507	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R508	80. 5253	2.2Kohm 5% Carbon film 1/8W

TYPE	Nº	CODE	DATA
	R509	80. 5253	2.2Kohm 5% Carbon film 1/8W
	R510	80. 5262	12Kohm 5% Carbon film 1/8W
	R511	80. 5247	680ohm 5% Carbon film 1/8W
	R512	80. 5243	330ohm 5% Carbon film 1/8W
	R513	80. 5243	330ohm 5% Carbon film 1/8W
	R514	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R515	80. 5262	12Kohm 5% Carbon film 1/8W
	R516	80. 5247	680ohm 5% Carbon film 1/8W
	R517	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R518	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R519	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R520	80. 5261	10Kohm 5% Carbon film 1/8W
	R521	86. 5060	25Kohm 20% Carbon pot. 0.1W
	R522	80. 5261	10Kohm 5% Carbon film 1/8W
	R523	80. 5255	3.3Kohm 5% Carbon film 1/8W
	R524	80. 5268	39Kohm 5% Carbon film 1/8W
	R525	80. 5268	39Kohm 5% Carbon film 1/8W
	R526	80. 5221	4.7ohm 5% Carbon film 1/8W
	R527	80. 5237	100ohm 5% Carbon film 1/8W
	R601	80. 5269	47Kohm 5% Carbon film 1/8W
	R602	80. 5265	22Kohm 5% Carbon film 1/8W
	R603	80. 5243	330ohm 5% Carbon film 1/8W
	R604	80. 5264	18Kohm 5% Carbon film 1/8W
	R605	80. 5261	10Kohm 5% Carbon film 1/8W
	R606	80. 5278	270Kohm 5% Carbon film 1/8W
	R607	86. 5080	10Kohm 20% Carbon pot. 0.1W
	R608	80. 5259	6.8Kohm 5% Carbon film 1/8W
	R609	89. 5053	470ohm 20% NTC 0.5W
	R610	80. 5260	8.2Kohm 5% Carbon film 1/8W
	R611	80. 5238	120ohm 5% Carbon film 1/8W
	R612	80. 5245	470ohm 5% Carbon film 1/8W
	R613	80. 5248	820ohm 5% Carbon film 1/8W
	R614	80. 5256	3.9Kohm 5% Carbon film 1/8W
	R615	80. 5269	47Kohm 5% Carbon film 1/8W
	R616	80. 5261	10Kohm 5% Carbon film 1/8W
	R617	80. 5280	390Kohm 5% Carbon film 1/8W
	R618	80. 5262	12Kohm 5% Carbon film 1/8W
	R619	80. 5266	27Kohm 5% Carbon film 1/8W
	R620	80. 5266	27Kohm 5% Carbon film 1/8W
	R621	80. 5252	1.8Kohm 5% Carbon film 1/8W
	R622	80. 5243	330ohm 5% Carbon film 1/8W
	R623	80. 5259	6.8Kohm 5% Carbon film 1/8W

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TYPE	NO	CODE	DATA
	L208	62. 0999	RF coil
	L209	62. 0998	RF coil
	L210	62. 1002	RF coil
	L211	62. 0999	RF coil
	L212	62. 0999	RF coil
	L213	61. 1383	RF choke
	L217	61. 1383	RF choke
	L218	62. 1002	RF coil
	L222	61. 1383	RF choke
	L223	62. 1000	RF coil
20W	L226	61. 5044	6. 3uH 10% HF choke 400mA
20W	L228	62. 1000	RF coil
5W	L228	62. 1000	RF coil
	L231	62. 0997	Strap
	L232	62. 0996	RF coil, L233 incl.
5W	L234	62. 1003	Strap inductance
	L301	61. 5034	RF coil
	L302	61. 5015	3. 3uH 10% HF choke 700mA
	L303	61. 5046	RF coil
	L305	61. 5045	RF coil
	L307	61. 1409	Helical coil
	L308	61. 1409	Helical coil
	L401	61. 1409	Helical coil
	L402	61. 1409	Helical coil
	L403	61. 1411	RF choke
	L405	61. 1409	Helical coil
	L406	61. 1409	Helical coil
	L407	61. 1410	Helical Coil
	L410	61. 5050	RF coil
	L501	61. 5027	21. 4MHz IF transformer
	L502	61. 5027	21. 4MHz IF transformer
	L503	61. 5025	455kHz IF transformer
	L504	61. 5025	455kHz IF transformer
	L601	61. 5023	75mH Choke 10mA
	P201	41. 5545	Fem. connector 3 pin
	P901	41. 0238	Modified connector
	P903	41. 0230	Fem. connector 7 pin
	Q151	99. 5347	PN2369 Transistor
	Q201	99. 5348	RF transistor 0. 4W
	Q202	99. 5355	RF transistor 0. 4W
	Q203	99. 5348	RF transistor 0. 4W
	Q204	99. 5354	RF transistor 0. 8W
	Q205	99. 5357	RF power transistor 5. 5W
20W	Q206	99. 5358	RF power transistor 28W
	Q207	99. 5345	BD201 Transistor
	Q208	99. 5251	BC307 transistor
	Q209	99. 5121	BC237 transistor
	Q210	99. 5121	BC237 transistor

TYPE	NO	CODE	DATA
	Q301	99. 5347	PN2369 Transistor
	Q302	99. 5347	PN2369 Transistor
	Q303	99. 5356	BFW92 Transistor
	Q401	99. 5290	BFR34 transistor
	Q402	99. 5245	2N5245 J-FET
	Q501	99. 5291	3N205 MOS-FET
	Q601	99. 5143	BC238 transistor
	Q602	99. 5201	BC239 transistor
	Q603	99. 5115	BC309 transistor
	Q604	99. 5115	BC309 transistor
	Q605	99. 5115	BC309 transistor
	R102	80. 5265	22Kohm 5% Carbon film 1/8W
	R103	80. 5243	330ohm 5% Carbon film 1/8W
	R104	80. 5095	51Kohm 5% Carbon film 1/8W
	R105	89. 5083	10. 5Kohm 1% Metal film 1/4W
	R106	89. 5085	12. 7Kohm 1% Metal film 1/4W
	R107	89. 5083	10. 5Kohm 1% Metal film 1/4W
	R108	89. 5082	5. 11Kohm 1% Metal film 1/4W
	R109	89. 5091	1. 3Kohm 5% Carbon film 1/8W
	R110	89. 5082	5. 11Kohm 1% Metal film 1/4W
	R112	89. 5086	20Kohm 1% Metal film 1/4W
	R113	89. 5084	12. 4Kohm 1% Metal film 1/4W
	R114	89. 5087	32. 4Kohm 1% Metal film 1/4W
	R115	80. 5249	1Kohm 5% Carbon film 1/8W
	R116	86. 5078	5Kohm 10% Carbon pot. 0. 5W
	R117	80. 5254	2. 7Kohm 5% Carbon film 1/8W
	R151	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R152	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R153	89. 5088	3. 3Kohm 10% NTC 0. 5W
	R154	80. 5269	47Kohm 5% Carbon film 1/8W
	R155	80. 5247	680ohm 5% Carbon film 1/8W
	R156	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R157	80. 5261	10Kohm 5% Carbon film 1/8W
	R158	80. 5242	270ohm 5% Carbon film 1/8W
	R160	80. 5263	15Kohm 5% Carbon film 1/8W
	R161	80. 5257	4. 7Kohm 5% Carbon film 1/8W
	R201	89. 5098	2. 43Kohm 1% Metal film 1/4W
	R202	89. 5099	232ohm 1% Metal film
	R203	80. 5229	22ohm 5% Carbon film 1/8W
	R204	80. 5233.	47ohm 5% Carbon film 1/8W
	R205	80. 5240	180ohm 5% Carbon film 1/8W

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TYPE	Nº	CODE	DATA
	R206	80. 5227	15ohm 5% Carbon film 1/8W
	R207	80. 5229	22ohm 5% Carbon film 1/8W
	R208	89. 5098	2. 43Kohm 1% Metal film 1/4W
	R209	89. 5097	392ohm 1% Metal film 1/4W
	R210	80. 5227	15ohm 5% Carbon film 1/8W
	R211	80. 5229	22ohm 5% Carbon film 1/8W
	R212	80. 5227	15ohm 5% Carbon film 1/8W
	R213	89. 5100	27ohm 5% Carbon comp. 1/4W
	R215	86. 5078	5Kohm 10% Carbon pot. 0. 5W
	R216	80. 5249	1Kohm 5% Carbon film 1/8W
	R217	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R218	80. 5249	1Kohm 5% Carbon film 1/8W
	R219	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R221	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R222	80. 5241	220ohm 5% Carbon film 1/8W
	R224	80. 5246	560ohm 5% Carbon film 1/8W
	R225	80. 5245	470ohm 5% Carbon film 1/8W
	R301	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R302	80. 5255	3. 3Kohm 5% Carbon film 1/8W
	R303	80. 5242	270ohm 5% Carbon film 1/8W
	R304	80. 5269	47Kohm 5% Carbon film 1/8W
	R305	80. 5247	680ohm 5% Carbon film 1/8W
	R306	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R307	80. 5261	10Kohm 5% Carbon film 1/8W
	R308	80. 5242	270ohm 5% Carbon film 1/8W
	R309	80. 5229	22ohm 5% Carbon film 1/8W
	R310	80. 5225	10ohm 5% Carbon film 1/8W
	R312	80. 5249	1Kohm 5% Carbon film 1/8W
	R313	80. 5234	56ohm 5% Carbon film 1/8W
	R314	80. 5225	10ohm 5% Carbon film 1/8W
	R315	80. 5225	10ohm 5% Carbon film 1/8W
	R401	80. 5257	4. 7Kohm 5% Carbon film 1/8W
	R402	80. 5249	1Kohm 5% Carbon film 1/8W
	R403	80. 5234	56ohm 5% Carbon film 1/8W
	R404	80. 5234	56ohm 5% Carbon film 1/8W
	R405	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R406	80. 5234	56ohm 5% Carbon film 1/8W
	R407	80. 5237	100ohm 5% Carbon film 1/8W
	R408	80. 5232	39ohm 5% Carbon film 1/8W
	R501	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R502	80. 5266	27Kohm 5% Carbon film 1/8W
	R503	80. 5266	27Kohm 5% Carbon film 1/8W
	R504	80. 5243	330ohm 5% Carbon film 1/8W
	R505	80. 5242	270ohm 5% Carbon film 1/8W
	R506	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R507	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R508	80. 5253	2. 2Kohm 5% Carbon film 1/8W

Storno

TYPE	Nº	CODE	DATA
	R509	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R510	80. 5262	12Kohm 5% Carbon film 1/8W
	R511	80. 5247	680ohm 5% Carbon film 1/8W
	R512	80. 5243	330ohm 5% Carbon film 1/8W
	R513	80. 5243	330ohm 5% Carbon film 1/8W
	R514	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R515	80. 5262	12Kohm 5% Carbon film 1/8W
	R516	80. 5247	680ohm 5% Carbon film 1/8W
	R517	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R518	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R519	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R520	80. 5261	10Kohm 5% Carbon film 1/8W
	R521	86. 5060	25Kohm 20% Carbon pot. 0. 1W
	R522	80. 5261	10Kohm 5% Carbon film 1/8W
	R523	80. 5255	3. 3Kohm 5% Carbon film 1/8W
	R524	80. 5268	39Kohm 5% Carbon film 1/8W
	R525	80. 5268	39Kohm 5% Carbon film 1/8W
	R526	80. 5221	4. 7ohm 5% Carbon film 1/8W
	R527	80. 5237	100ohm 5% Carbon film 1/8W
	R601	80. 5269	47Kohm 5% Carbon film 1/8W
	R602	80. 5265	22Kohm 5% Carbon film 1/8W
	R603	80. 5243	330ohm 5% Carbon film 1/8W
	R604	80. 5264	18Kohm 5% Carbon film 1/8W
	R605	80. 5261	10Kohm 5% Carbon film 1/8W
	R606	80. 5278	270Kohm 5% Carbon film 1/8W
	R607	86. 5080	10Kohm 20% Carbon pot. 0. 1W
	R608	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R609	89. 5053	470ohm 20% NTC 0. 5W
	R610	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R611	80. 5238	120ohm 5% Carbon film 1/8W
	R612	80. 5245	470ohm 5% Carbon film 1/8W
	R613	80. 5248	820ohm 5% Carbon film 1/8W
	R614	80. 5256	3. 9Kohm 5% Carbon film 1/8W
	R615	80. 5269	47Kohm 5% Carbon film 1/8W
	R616	80. 5261	10Kohm 5% Carbon film 1/8W
	R617	80. 5280	390Kohm 5% Carbon film 1/8W
	R618	80. 5262	12Kohm 5% Carbon film 1/8W
	R619	80. 5266	27Kohm 5% Carbon film 1/8W
	R620	80. 5266	27Kohm 5% Carbon film 1/8W
	R621	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R622	80. 5243	330ohm 5% Carbon film 1/8W
	R623	80. 5259	6. 8Kohm 5% Carbon film 1/8W

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TYPE	Nº	CODE	DATA
20W	R624	80.5261	10Kohm 5% Carbon film 1/8W
	R625	80.5255	3.3Kohm 5% Carbon film 1/8W
	R626	80.5249	1Kohm 5% Carbon film 1/8W
	R627	80.5241	220ohm 5% Carbon film 1/8W
	R628	80.5237	100ohm 5% Carbon film 1/8W
	R629	80.5260	8.2Kohm 5% Carbon film 1/8W
	R630	86.5077	47Kohm 20% Carbon pot. 0.15W
	R631	80.5229	22ohm 5% Carbon film 1/8W
	R632	80.5213	1ohm 5% Carbon film 1/8W
	R633	80.5238	120ohm 5% Carbon film 1/8W
	R634	80.5213	1ohm 5% Carbon film 1/8W
	R635	80.5234	56ohm 5% Carbon film 1/8W
	R636	80.52xx	ADJ 5% Carbon film 1/8W
	R637	80.5247	608ohm 5% Carbon film 1/8W
	R638	80.5413	1ohm 5% Carbon film 1/4W
	R639	80.5237	100ohm 5% Carbon film 1/8W
	S601	47.0641	Switch incl. S602
	U101	14.6131	LM358 Dual op-amp
	U501	14.5128	CA3054 IF amplifier
	U502	14.5129	TBA750 IF amplifier/detector
	U601	14.5130	TDA2002 AF power amplifier
	U602	14.0133	Voltage regulator 8V 0.5A
	W204	62.1004	Jumper
	Z201	61.1384	Damping choke
	Z202	61.1384	Damping choke
	Z502	69.5045	455kHz Ceramic filter 20/25kHz

Storno

TYPE	Nº	CODE	DATA

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NOTE 1
TO MODIFY FOR MULTI FREQUENCY
AND FOR TEMPERATURE COMPENSATED
OSCILLATORS REMOVE R157(DISABLE TX
OSC.) AND R309 (DISABLE RX OSC.)

NOTE 2
VALUE OF R636 DEPENDS ON COLOR
MARK ON U602

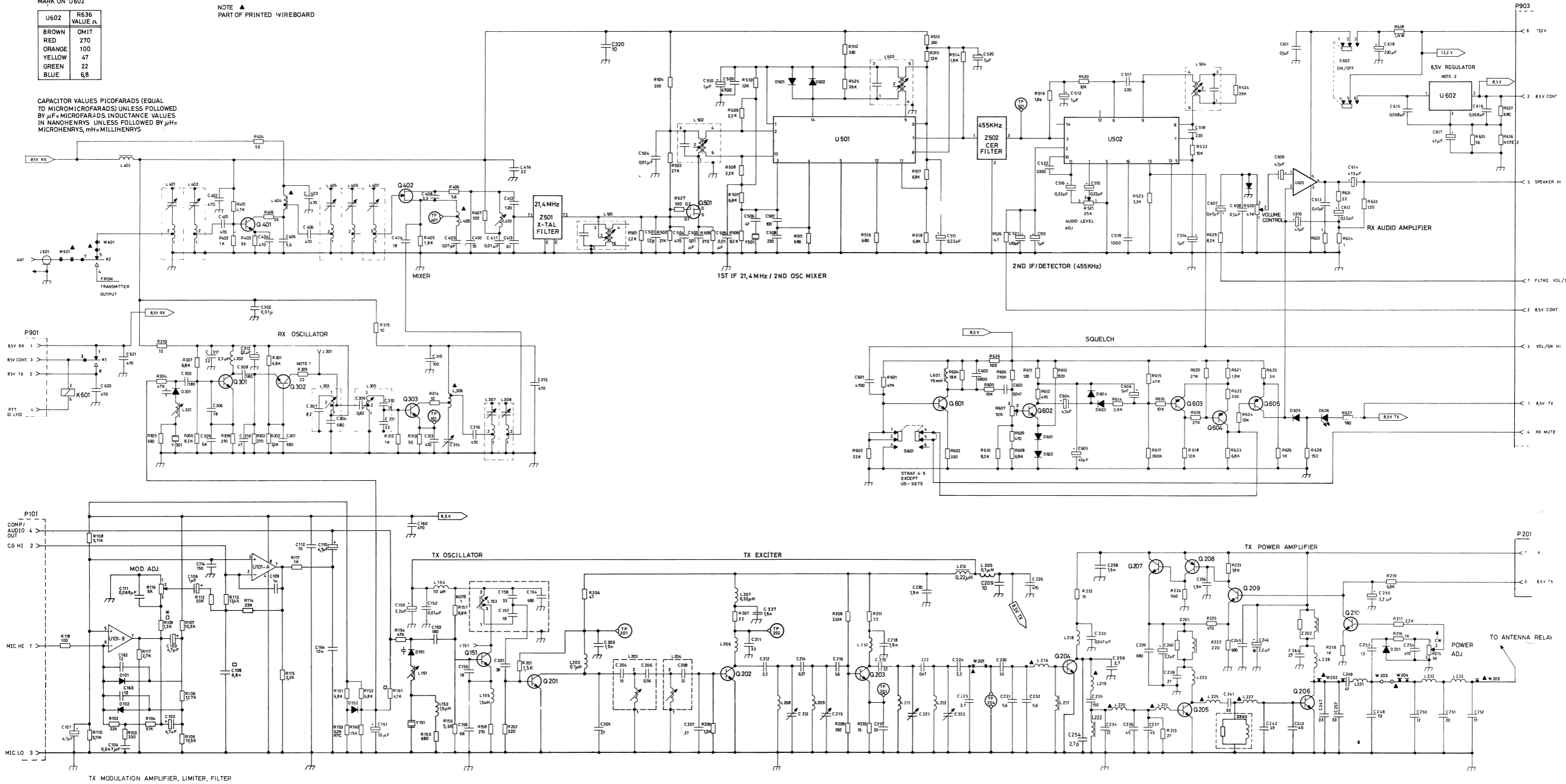
U602	R636 VALUE Δ
BROWN	OMIT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6,8

CAPACITOR VALUES PICOFARADS (EQUAL
TO MICROMICROFARADS) UNLESS FOLLOWED
BY μF= MICROFARADS. INDUCTANCE VALUES
IN NANOHENRYS UNLESS FOLLOWED BY μH=
MICROHENRYS, mH=MILLIHENRYS

NOTE *
R109 = 1,8K FOR SWEDEN

NOTE D
12,5 KHz UNITS (RF 5664)
R109 = 1,8K
R161 = REMOVED
C108 = 10nF

NOTE ▲
PART OF PRINTED WIREBOARD



TYPE	Nº	CODE	DATA
RF5664	C102	73. 5172	4. 7uF 20% Tantal
	C103	73. 5172	4. 7uF 20% Tantal
	C104	76. 5142	47nF 5% Polyester FL
	C106	73. 5170	1. 0uF 20% Tantal
	C107	73. 5172	4. 7uF 20% Tantal
	C108	76. 5140	6. 8nF 5% Polyester FL
	C108	76. 5135	10 nF 5% Polyester FL
	C109	76. 5156	1nF 5% Polyester FL
	C110	73. 5172	4. 7uF 20% Tantal
	C111	76. 5151	68nF 5% Polyester FL
	C112	74. 5371	10pF 20% Ceram DI
	C114	74. 5392	150 pF 20% Ceramic DI2
	C151	73. 5173	10uF 20% Tantal
	C152	76. 5135	10nF 10% Polyester FL
	C153	74. 5386	180pF 5% Ceram DI
	C154	74. 5396	680pF 20% Ceram DI
	C155	74. 5405	68pF 5% Ceram DI
	C156	74. 5403	18pF 5% Ceram DI
	C157	74. 5374	18pF 5% Ceram DI
	C158	74. 5377	33pF 5% Ceram DI
	C159	73. 5171	2. 2uF 20% Tantal
	C160	74. 5395	470pF 20% Ceram DI
	C162	74. 5372	12pF 5% Ceram DI
	C163	74. 5372	12pF 5% Ceram DI
	C164	76. 5135	10nF 10% Polyester FL
	C201	74. 5378	39pF 5% Ceram DI
	C203	74. 5398	1. 5nF 20% Ceram DI
	C204	74. 5373	15pF 5% Ceram DI
	C205	74. 5376	27pF 5% Ceram DI
	C206	79. 5005	0. 56pF 5% Phenolic TB
	C207	74. 5376	27pF 5% Ceram DI
	C208	74. 5372	12pF 5% Ceram DI
	C209	74. 5371	10pF 5% Ceram DI
	C211	74. 5377	33pF 5% Ceram DI
	C212	74. 5413	2. 2pF 0. 1pF DI
	C213	78. 5065	2/10pF Air trimmer
	C214	79. 5002	0. 27pF 5% Phenolic TB
	C215	78. 5065	2/10pF Air trimmer
	C216	74. 5368	5. 6pF 0. 25pF Ceram DI
	C217	74. 5377	33pF 5% Ceram DI
	C218	74. 5398	1. 5nF 20% Ceram DI
	C219	74. 5413	2. 2pF 0. 1pF DI
C221	74. 5398	1. 5nF 20% Ceram DI	
C222	79. 5004	0. 47pF 5% Phenolic TB	
C223	78. 5065	2/10pF Air trimmer	

TYPE	Nº	CODE	DATA
	C224	74. 5413	2. 2pF 0. 1pF DI
	C225	74. 5364	2. 7pF 0. 25pF Ceram DI
	C226	74. 5395	470pF 20% Ceram DI
	C227	74. 5398	1. 5 nF 20% Ceramic 2DI
	C230	74. 5377	33pF 5% Ceram DI
	C231	74. 5368	5. 6pF 0. 25pF Ceram DI
	C232	74. 5368	5. 6pF 0. 25pF Ceram DI
	C233	76. 5139	47nF 10% Polyester FL
	C234	74. 5372	12pF 5% Ceram DI
	C235	74. 5414	150pF 20% Ceram DI
	C236	75. 5038	45pF 5% Mica
	C237	75. 5038	45pF 5% Mica
	C238	74. 5376	27pF 5% Ceram DI
	C239	74. 5396	680pF 20% Ceram DI
	C240	73. 5171	2. 2uF 20% Tantal
	C241	75. 5025	30 pF 5% Teflon
	C242	75. 5054	39 pF 5% Mica
	C243	75. 5038	45 pF 5% Mica
	C244	74. 5376	27 pF 5% Ceram DI
	C245	74. 5396	680 pF 20% Ceram DI
	C246	J706339P2	2. 2 uF 20% Tantal
	C247	75. 5053	33 pF 5% Mica
	C248	75. 5051	13 pF 5% Mica
	C249	75. 5044	47 pF 2% Teflon
	C250	75. 5034	12pF 0. 5pF Teflon
	C251	75. 5036	20pF 0. 5pF Teflon
	C252	75. 5035	11pF 0. 5pF Teflon
	C253	74. 5361	1. 5 pF 0. 25 pF Ceram DI
	C254	74. 5395	470pF 20% Ceram DI
	C255	73. 5171	2. 2uF 20% Tantal
	C256	74. 5398	1. 5nF 20% Ceram DI
	C257	75. 5053	33 pF 5% Mica
	C258	74. 5398	1. 5 nF 20% Ceramic 2DI
	C259	74. 5364	2. 7 pF 0. 25 pF Ceram DI
	C301	74. 5396	680pF 20% Ceram DI
	C302	76. 5135	10nF 10% Polyester FL
	C303	74. 5386	180pF 5% Ceram DI
	C304	74. 5396	680pF 20% Ceram DI
	C305	74. 5405	68pF 5% Ceram DI
	C306	74. 5403	18pF 5% Ceram DI

TYPE	NQ	CODE	DATA
	J151	41.5529	Socket
	J301	41.5529	Socket
	J601	41.5165	Connector UHF
	K601	58.5085	21-21 Relay 12V
	L151	61.5034	RF coil, tuneable
	L152	61.5030	1.5uH 10% HF choke 800mA
	L153	61.5033	RF coil, tuneable
	L154	61.5031	10uH 10% HF choke 300mA
	L155	61.5030	1.5uH 10% HF choke 800mA
	L202	A700024P1	0.1 uH 10% HF choke 1.3 A
	L203	61.5035	RF coil, tuneable
	L204	61.5035	RF coil, tuneable
	L205	A700024P1	0.1 uH 10% HF choke
	L206	62.1001	RF coil
	L207	A700024P5	0.22 uH 10% HF choke
	L208	62.0999-01	RF coil
	L209	62.0998-01	RF coil
	L210	62.1002	RF coil
	L211	62.0999-01	RF coil
	L212	62.0999-01	RF coil
	L213	A700024P5	0.22 uH 10% HF-choke
	L217	61.1383	RF choke
	L218	62.1034	RF coil
	L222	61.1383	RF choke
	L223	62.1000	RF coil
	L226	61.5044	6.3 uH 10% HF choke 400 mA
	L228	62.1000	RF coil
	L231	62.1038	Strap
	L232	62.0996	RF coil, L233 incl.
	L301	61.5034	RF coil, tuneable
	L302	61.5015	3.3uH 10% HF choke 700mA
	L303	61.5046	RF coil, tuneable
	L305	61.5045	RF coil, tuneable
	L307	J706154P2	Helical coil
	L308	J706154P2	Helical coil
	L401	J706154P2	Helical coil
	L402	J706154P2	Helical coil
	L403	61.1411	RF choke
	L405	J706154P2	Helical coil
	L406	J706154P2	Helical coil
	L407	J706084P1	Helical coil
	L410	61.5050	RF coil, tuneable
	L501	61.5027	21.4MHz IF transformer

TYPE	NQ	CODE	DATA
	L502	61.5027	21.4MHz IF transformer
	L503	61.5025	455kHz IF transformer
	L504	61.5025	455kHz IF transformer
	L601	61.5023	75mH Choke 10mA
	P101	28.0123	Tuning slug
	P201	41.0238	Modified connector
	P901	41.0238	Fem. connector 3 pin
	P903	41.0230	Modified connector 7 pin
	Q151	99.5347	PN2369 Transistor
	Q201	99.5348	RF transistor 0.4W
	Q202	99.5355	RF transistor 0.4W
	Q203	99.5348	RF transistor 0.4W
	Q204	99.5354	RF transistor 0.8W
	Q205	99.5357	RF power transistor
	Q206	99.5375	RF Power transistor 5.5W
	Q207	99.5345	BD201 Transistor 23 W
	Q208	99.5251	BC307 transistor
	Q209	99.5121	BC237 transistor
	Q210	99.5121	BC237 transistor
	Q301	99.5347	PN2369 Transistor
	Q302	99.5347	PN2369 Transistor
	Q303	99.5356	BFW92 Transistor
	Q401	99.5290	BFR34 transistor
	Q402	99.5245	2N5245 J-FET
	Q501	99.5291	3N205 MOS-FET
	Q601	99.5143	BC238 transistor
	Q602	99.5201	BC239 transistor
	Q603	99.5115	BC309 transistor
	Q604	99.5115	BC309 transistor
	Q605	99.5115	BC309 transistor
	R102	80.5265	22Kohm 5% Carbon film 1/8W
	R103	80.5243	330ohm 5% Carbon film 1/8W
	R104	89.5095	51Kohm 5% Carbon film 1/8W
	R105	89.5083	10.5Kohm 1% Metal film 1/4W
	R106	89.5085	12.7Kohm 1% Metal film 1/4W
	R107	89.5083	10.5Kohm 1% Metal film 1/4W
	R108	89.5082	5.11Kohm 1% Metal film 1/4W

RF UNIT RF5660b

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TYPE	Nº	CODE	DATA
RF5664	R109	89. 5091	1. 3Kohm 5% Carbon film 1/8W
	R109	80. 5252	1. 8 Kohm 5% Carbon film 1/8 W
	R110	89. 5082	5. 11Kohm 1% Metal film 1/4W
	R112	89. 5086	20Kohm 1% Metal film 1/4W
	R113	89. 5084	12. 4Kohm 1% Metal film 1/4W
	R114	80. 5267	33 Kohm 5% Carbon film 1/8W
	R115	80. 5253	2. 2 Kohm 5% Carbon film 1/8W
	R116	86. 5078	5Kohm 10% Trimm. Cermet 0. 5W
	R117	80. 5249	1 Kohm 5% Carbon film 1/8 W
	R118	80. 5237	100 ohm 5% carbon film 1/8 W
	R151	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R152	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R153	89. 5088	3. 3Kohm 10% NTC 0. 5W
	R154	80. 5269	47Kohm 5% Carbon film 1/8W
	R155	80. 5242	270ohm 5% Carbon film 1/8W
	R156	80. 5258	5. 6Kohm 5% Carbon film 1/8W
	R157	80. 5259	6. 8 Kohm 5% Carbon film 1/8W
	R158	80. 5242	270ohm 5% Carbon film 1/8W
	R160	80. 5263	15Kohm 5% Carbon film 1/8W
	R161	80. 5257	4. 7Kohm 5% Carbon film 1/8W
	R201	A700019P39	1. 5 Kohm 5% Carbon film 1/4W
	R202	80. 5241	220 ohm 5% Carbon film 1/8 W
	R204	80. 5233	47ohm 5% Carbon film 1/8W
	R205	80. 5250	1. 2 Kohm 5% Carbon film 1/8W
	R207	80. 5229	22ohm 5% Carbon film 1/8W
	R208	89. 5098	2. 43Kohm 1% Metal film 1/4W
	R209	89. 5097	392ohm 1% Metal film 1/4W
	R210	80. 5227	15ohm 5% Carbon film 1/8W
	R211	80. 5229	22ohm 5% Carbon film 1/8W
	R212	80. 5227	15ohm 5% Carbon film 1/8W
	R213	89. 5100	27ohm 5% Carbon comp. 1/4W
	R215	86. 5078	5Kohm 10% Trimm. Cermet 0. 5 W
	R216	80. 5249	1Kohm 5% Carbon film 1/8W
	R217	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R218	80. 5249	1Kohm 5% Carbon film 1/8W
	R219	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R221	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R222	80. 5241	220ohm 5% Carbon film 1/8W
	R224	80. 5246	560ohm 5% Carbon film 1/8W
	R225	80. 5245	470ohm 5% Carbon film 1/8W
	R301	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R302	80. 5255	3. 3Kohm 5% Carbon film 1/8W
	R303	80. 5242	270ohm 5% Carbon film 1/8W
	R304	80. 5269	47Kohm 5% Carbon film 1/8W
	R305	80. 5247	680ohm 5% Carbon film 1/8W

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TYPE	Nº	CODE	DATA
	R306	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R307	80. 5259	6. 8 Kohm 5% Carbon film 1/8W
	R308	80. 5242	270ohm 5% Carbon film 1/8W
	R309	80. 5229	22ohm 5% Carbon film 1/8W
	R310	80. 5225	10ohm 5% Carbon film 1/8W
	R312	80. 5249	1Kohm 5% Carbon film 1/8W
	R313	80. 5234	56ohm 5% Carbon film 1/8W
	R314	80. 5225	10ohm 5% Carbon film 1/8W
	R315	80. 5225	10ohm 5% Carbon film 1/8W
	R401	80. 5257	4. 7Kohm 5% Carbon film 1/8W
	R402	80. 5249	1Kohm 5% Carbon film 1/8W
	R403	80. 5234	56ohm 5% Carbon film 1/8W
	R404	80. 5234	56ohm 5% Carbon film 1/8W
	R405	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R406	80. 5234	56ohm 5% Carbon film 1/8W
	R407	80. 5237	100ohm 5% Carbon film 1/8W
	R408	80. 5232	39ohm 5% Carbon film 1/8W
	R501	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R502	80. 5266	27Kohm 5% Carbon film 1/8W
	R503	80. 5266	27Kohm 5% Carbon film 1/8W
	R504	80. 5243	330ohm 5% Carbon film 1/8W
	R505	80. 5242	270ohm 5% Carbon film 1/8W
	R506	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R507	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R508	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R509	80. 5253	2. 2Kohm 5% Carbon film 1/8W
	R510	80. 5262	12Kohm 5% Carbon film 1/8W
	R511	80. 5247	680ohm 5% Carbon film 1/8W
	R512	80. 5243	330ohm 5% Carbon film 1/8W
	R513	80. 5243	330ohm 5% Carbon film 1/8W
	R514	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R515	80. 5262	12Kohm 5% Carbon film 1/8W
	R516	80. 5247	680ohm 5% Carbon film 1/8W
	R517	80. 5259	6. 8Kohm 5% Carbon film 1/8W
	R518	80. 5260	8. 2Kohm 5% Carbon film 1/8W
	R519	80. 5252	1. 8Kohm 5% Carbon film 1/8W
	R520	80. 5261	10Kohm 5% Carbon film 1/8W
	R521	86. 5060	25Kohm 20% Carbon pot. 0. 1W
	R522	80. 5261	10Kohm 5% Carbon film 1/8W

RF UNIT RF5660b

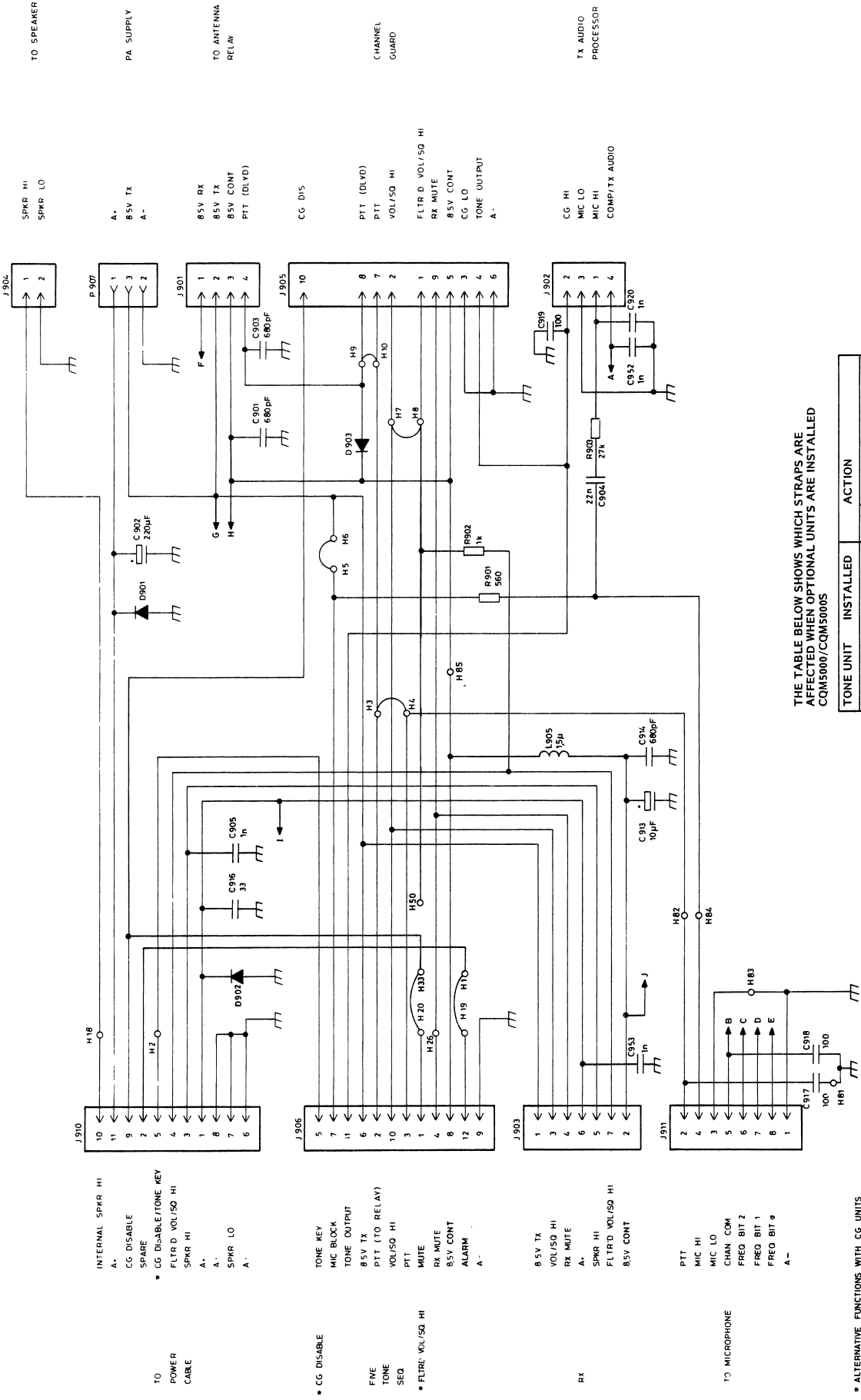
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TYPE	Nº	CODE	DATA
	R523	80.5255	3.3Kohm 5% Carbon film
	R524	80.5268	39Kohm 5% Carbon film
	R525	80.5268	39Kohm 5% Carbon film
	R526	80.5221	4.7ohm 5% Carbon film
	R527	80.5237	100ohm 5% Carbon film
	R601	80.5269	47Kohm 5% Carbon film
	R602	80.5265	22Kohm 5% Carbon film
	R603	80.5243	330ohm 5% Carbon film
	R604	80.5264	18Kohm 5% Carbon film
	R605	80.5261	10Kohm 5% Carbon film
	R606	80.5278	270Kohm 5% Carbon film
	R607	86.5080	10Kohm 20% Carbon pot.
	R608	80.5259	6.8Kohm 5% Carbon film
	R609	89.5053	470ohm 20% NTC
	R610	80.5260	8.2Kohm 5% Carbon film
	R611	80.5238	120ohm 5% Carbon film
	R612	80.5245	470ohm 5% Carbon film
	R613	80.5248	820ohm 5% Carbon film
	R614	80.5256	3.9Kohm 5% Carbon film
	R615	80.5269	47Kohm 5% Carbon film
	R616	80.5261	10Kohm 5% Carbon film
	R617	80.5280	390Kohm 5% Carbon film
	R618	80.5262	12Kohm 5% Carbon film
	R619	80.5266	27Kohm 5% Carbon film
	R620	80.5266	27Kohm 5% Carbon film
	R621	80.5252	1.8Kohm 5% Carbon film
	R622	80.5243	330ohm 5% Carbon film
	R623	80.5259	6.8Kohm 5% Carbon film
	R624	80.5261	10Kohm 5% Carbon film
	R625	89.5093	3 Kohm 5% Carbon film
	R626	80.5249	1Kohm 5% Carbon film
	R627	80.5240	180 ohm 5% Carbon film
	R628	80.5239	150 ohm 5% Carbon film
	R629	80.5260	8.2Kohm 5% Carbon film
	R630	86.5077	47Kohm 20% Carbon pot., log.
	R631	80.5229	22ohm 5% Carbon film
	R632	80.5213	1ohm 5% Carbon film
	R633	80.5238	120ohm 5% Carbon film
	R634	80.5213	1ohm 5% Carbon film
	R635	80.5234	56ohm 5% Carbon film
	R636	80.52xx	ADJ 5% Carbon film, see diagr.
	R637	80.5247	680 ohm 5% Carbon film
	R638	80.5413	1ohm 5% Carbon film
	R639	80.5237	100ohm 5% Carbon film

TYPE	Nº	CODE	DATA
	S601	B800563P1	Switch
	S602	B800563P1	Switch
	U101	14.5141	4558 Dual op-amp
	U501	14.5128	CA3054 IF amplifier
	U502	14.5129	TBA750 IF amplifier/detector
	U601	14.5130	TDA2002 AF power amplifier
	U602	14.0133	Voltage reg., grouped
	W201	62.1004	Jumper
	W202	62.1004	Jumper
	W203	62.1037	Coil, jumper
	W204	62.1004	Jumper
	W205	62.1004	Jumper
	W401	62.1004	Jumper
	W601	62.1004	Jumper
	Y501	98.5032	Crystal 98-58
	Z201	61.1384	Damping choke
	Z202	61.1384	Damping choke
	Z501	69.5040	21.4MHz Crystal filter
	Z501	69.5041	21.4MHz Crystal filter
	Z501	J706046P1	21.4 MHz Crystal filter
	Z502	69.5045	455kHz Ceramic filter
	Z502	69.5046	455 kHz Ceramic filter
	Z203	A701092G1	Damping Choke

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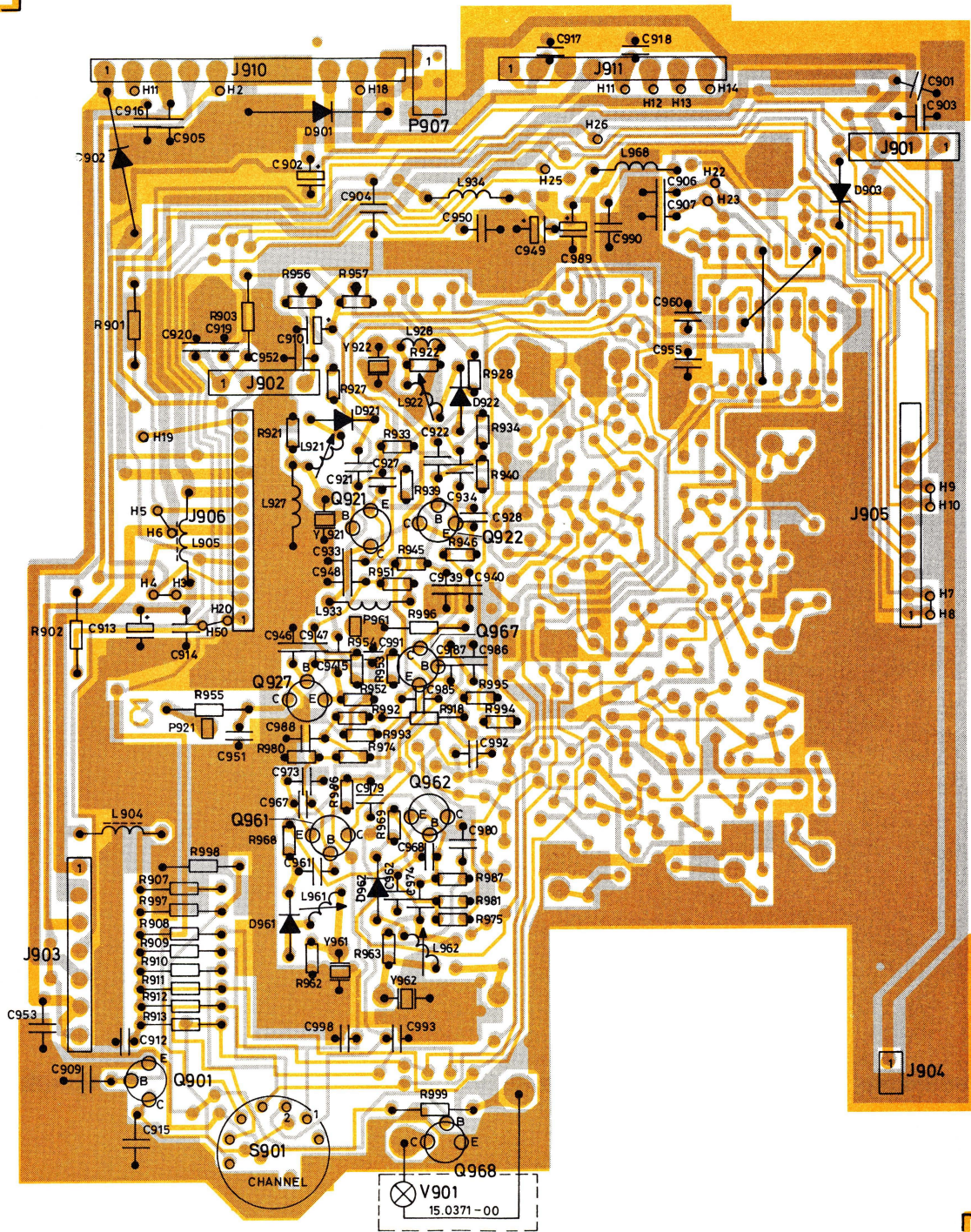
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THE TABLE BELOW SHOWS WHICH STRAPS ARE AFFECTED WHEN OPTIONAL UNITS ARE INSTALLED CQM5000/CQM5005

TO	UNIT	INSTALLED	ACTION
TO POWER CABLE	TQ5001	TQ5002	CUT
	TQ5004	TQ5005	
	CL5001		
TO MICROPHONE	TQ5006		CUT
	TR5002	FN5002	CUT
	TT5002		CUT

* ALTERNATIVE FUNCTIONS WITH CG UNITS TO 5003, TT 5001, TR 5001, FN 5001



CHANNEL SELECTOR UNIT XS 5661

TYPE	NQ	CODE	DATA
	C901	74. 5396	680pF 20% Ceramic DI
	C902	73. 5165	220uF -10%/+100% Elco
	C903	74. 5396	680pF 20% Ceramic DI
	C904	76. 5141	22nF 5% Polyester FL
	C905	74. 5397	1nF 20% Ceramic DI
	C906	74. 5397	1nF 20% Ceramic DI
	C907	74. 5397	1nF 20% Ceramic DI
	C909	74. 5397	1nF 20% Ceramic DI
	C910	73. 5173	10uF 20% Tantal
	C912	74. 5395	470pF 5% Ceramic DI
	C913	73. 5173	10uF 20% Tantal
	C914	74. 5396	680pF 20% Ceramic DI
	C915	74. 5375	22pF 5% Ceramic DI
	C916	74. 5377	33pF 5% Ceramic DI
	C917	74. 5391	100pF 20% Ceramic DI
	C918	74. 5391	100pF 20% Ceramic DI
	C919	74. 5391	100pF 20% Ceramic DI
	C920	74. 5391	100pF 20% Ceramic DI
	C921	74. 5386	180pF 5% Ceramic DI
	C922	74. 5386	180pF 5% Ceramic DI
	C927	74. 5403	18pF 5% Ceramic DI
	C928	74. 5403	18pF 5% Ceramic DI
	C933	74. 5405	68pF 5% Ceramic DI
	C934	74. 5405	68pF 5% Ceramic DI
	C939	74. 5397	1nF 20% Ceramic DI
	C940	74. 5397	1nF 20% Ceramic DI
	C945	74. 5386	180pF 5% Ceramic DI
	C946	74. 5397	1nF 20% Ceramic DI
	C947	74. 5397	1nF 20% Ceramic DI
	C948	74. 5396	680pF 20% Ceramic DI
	C949	73. 5172	4. 7uF 20% Tantal
	C950	76. 5135	10nF 10% Polyester FL
	C951	74. 5363	2. 2pF 0. 25pF Ceramic D
	C952	74. 5391	100pF 20% Ceramic DI
	C953	74. 5397	1nF 20% Ceramic DI
	C955	74. 5395	470pF 5% Ceramic DI
	C960	74. 5395	470pF 5% Ceramic DI
	C961	74. 5386	180pF 5% Ceramic DI
	C962	74. 5386	180pF 5% Ceramic DI
	C967	74. 5403	18pF 5% Ceramic DI
	C968	74. 5405	68pF 5% Ceramic DI
	C973	74. 5405	68pF 5% Ceramic DI
	C974	74. 5405	68pF 5% Ceramic DI
	C979	74. 5397	1nF 20% Ceramic DI
	C980	74. 5397	1nF 20% Ceramic DI
	C985	74. 5386	180pF 5% Ceramic DI
	C986	74. 5397	1nF 20% Ceramic DI
	C987	74. 5397	1nF 20% Ceramic DI

TYPE	NQ	CODE	DATA
	C988	74. 5396	680pF 20% Ceramic DI
	C989	73. 5172	4. 7uF 20% Tantal
	C990	74. 5395	470pF 5% Ceramic DI
	C991	74. 5363	2. 2pF 0. 25pF Ceramic D
	C992	74. 5376	27pF 5% Ceramic
	C994	74. 5395	470pF 5% Ceramic DI
	C998	74. 5395	470pF 5% Ceramic DI
	C999	74. 5395	470pF 5% Ceramic DI
	D901	99. 5220	1N5401 Diode
	D902	99. 5220	1N5401 Diode
	D903	99. 5237	1N4148 Diode
	D921	99. 5341	Varicap
	D922	99. 5341	Varicap
	D961	99. 5341	Varicap
	D962	99. 5341	Varicap
	J901	41. 0228	Male connector
	J902	41. 0228	Male connector
	J903	41. 0229	Male connector
	J904	41. 0225	Male connector
	J905	41. 0245	Male connector
	J906	41. 0227	Male connector
	J907	41. 5545	Fem. connector
	J910	41. 0232	Male connector
	J911	41. 0231	Male connector
	L904	61. 5029	1. 0uH RF choke
	L905	61. 5030	1. 5uH RF choke
	L921	61. 5034	45-55MHz RF coil
	L922	61. 5034	45-55MHz RF coil
	L927	61. 5030	1. 5uH RF choke
	L928	61. 5030	1. 5uH RF choke
	L933	61. 5029	1uH RF choke
	L934	61. 5031	10uH RF choke
	L961	61. 5034	45-55MHz RF coil
	L962	61. 5034	45-55MHz RF coil
	L968	61. 5031	10uH RF choke
	P921	41. 5550	Pin connector
	P961	41. 5550	Pin connector
	Q901	99. 5121	BC237 Transistor
	Q921	99. 5347	PN2369A Transistor
	Q922	99. 5347	PN2369A Transistor
	Q927	99. 5347	PN2369A Transistor
	Q961	99. 5347	PN2369A Transistor

CHANNEL SWITCH XS5661

X402. 688

N _o	CODE	DATA
C901	74.5396	680pF 20% Ceramic DI
C902	73.5165	220uF -10%/+100% Elco
C903	74.5396	680pF 20% Ceramic DI
C904	76.5141	22nF 5% Polyester FL
C905	74.5397	1nF 20% Ceramic DI
C906	74.5397	1nF 20% Ceramic DI
C907	74.5397	1nF 20% Ceramic DI
C909	74.5397	1nF 20% Ceramic DI
C910	A701534P7	10uF 20% Tantal
C912	74.5395	470pF 5% Ceramic DI
C913	A701534P7	10uF 20% Tantal
C914	74.5396	680pF 20% Ceramic DI
C915	74.5375	22pF 5% Ceramic DI
C916	74.5377	33pF 5% Ceramic DI
C917	74.5391	100pF 20% Ceramic DI
C918	74.5391	100pF 20% Ceramic DI
C919	74.5391	100pF 20% Ceramic DI
C920	74.5391	100pF 20% Ceramic DI
C921	74.5386	180pF 5% Ceramic DI
C922	74.5386	180pF 5% Ceramic DI
C927	74.5403	18pF 5% Ceramic DI
C928	74.5403	18pF 5% Ceramic DI
C933	74.5405	68pF 5% Ceramic DI
C934	74.5405	68pF 5% Ceramic DI
C939	74.5397	1nF 20% Ceramic DI
C940	74.5397	1nF 20% Ceramic DI
C945	74.5386	180pF 5% Ceramic DI
C946	74.5397	1nF 20% Ceramic DI
C947	74.5397	1nF 20% Ceramic DI
C948	74.5396	680pF 20% Ceramic DI
C949	A701534P6	4.7uF 20% Tantal
C950	A700234P7	10nF 10% Polyester FL
C951	74.5363	2.2pF 0.25pF Ceramic D
C952	74.5391	100pF 20% Ceramic DI
C953	74.5397	1nF 20% Ceramic DI
C955	74.5395	470pF 5% Ceramic DI
C960	74.5395	470pF 5% Ceramic DI
C961	74.5386	180pF 5% Ceramic DI
C962	74.5386	180pF 5% Ceramic DI
C967	74.5403	18pF 5% Ceramic DI
C968	74.5403	18pF 5% Ceramic DI
C973	74.5405	68pF 5% Ceramic DI

N _o	CODE	DATA
C974	74.5405	68pF 5% Ceramic DI
C979	74.5397	1nF 20% Ceramic DI
C980	74.5397	1nF 20% Ceramic DI
C985	74.5386	180pF 5% Ceramic DI
C986	74.5397	1nF 20% Ceramic DI
C987	74.5397	1nF 20% Ceramic DI
C988	74.5396	680pF 20% Ceramic DI
C989	A701534P6	4.7uF 20% Tantal
C990	74.5395	470pF 5% Ceramic DI
C991	74.5361	1.5pF 0.25pF Ceramic D
C992	74.5376	27pF 5% Ceramic
C994	74.5395	470pF 5% Ceramic DI
C998	74.5395	470pF 5% Ceramic DI
C999	74.5395	470pF 5% Ceramic DI
D901	99.5220	1N5401 Diode
D902	99.5220	1N5401 Diode
D903	99.5237	1N4148 Diode
D921	J706262P1	Varicap
D922	J706262P1	Varicap
D961	J706262P1	Varicap
D962	J706262P1	Varicap
J901	41.0228	Male connector
J902	41.0228	Male connector
J903	41.0229	Male connector
J904	41.0225	Male connector
J905	41.0245	Male connector
J906	41.0227	Male connector
J907	41.5545	Fem. connector
J910	41.0232	Male connector
J911	41.0231	Male connector
L904	61.5029	1.0uH RF choke
L905	61.5030	1.5uH RF choke
L921	J706029P4	45-55MHz RF coil
L922	J706029P4	45-55MHz RF coil
L927	61.5030	1.5uH RF choke
L928	61.5030	1.5uH RF choke
L933	61.5029	1uH RF choke
L934	61.5031	10uH RF choke
L961	J706029P4	45-55MHz RF coil
L962	J706029P4	45-55MHz RF coil
L968	61.5031	10uH RF choke
P921	41.5550	Pin connector

CHANNEL SWITCH XS5661

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Storno

N ^o	CODE	DATA
P961	41.5550	Pin connector
Q901	99.5121	BC237 Transistor
Q921	99.5347	PI2369A Transistor
Q922	99.5347	PI2369A Transistor
Q927	99.5347	PI2369A Transistor
Q961	99.5347	PI2369A Transistor
Q962	99.5347	PI2369A Transistor
Q967	99.5347	PI2369A Transistor
Q968	99.5121	BC237 Transistor
R901	80.5246	560ohm 5% Carbon film
R902	80.5249	1Kohm 5% Carbon film
R903	80.5266	27Kohm 5% Carbon film
R907	80.5261	10Kohm 5% Carbon film
R908	80.5261	10Kohm 5% Carbon film
R909	80.5261	10Kohm 5% Carbon film
R918	80.5225	10ohm 5% Carbon film
R921	80.5242	270ohm 5% Carbon film
R922	80.5242	270ohm 5% Carbon film
R927	80.5269	47Kohm 5% Carbon film
R928	80.5269	47Kohm 5% Carbon film
R933	80.5259	6.8Kohm 5% Carbon film
R934	80.5259	6.8Kohm 5% Carbon film
R939	80.5258	5.6Kohm 5% Carbon film
R940	80.5258	5.6Kohm 5% Carbon film
R945	80.5242	270ohm 5% Carbon film
R946	80.5242	270ohm 5% Carbon film
R951	80.5237	100ohm 5% Carbon film
R952	80.5242	270ohm 5% Carbon film
R953	80.5255	3.3Kohm 5% Carbon film
R954	80.5259	6.8Kohm 5% Carbon film
R955	80.5232	39ohm 5% Carbon film
R956	86.5079	10Kohm 10% Trim Cemmet
R957	86.5079	10Kohm 10% Trim Cemmet
R962	80.5247	680ohm 5% Carbon film
R963	80.5247	680ohm 5% Carbon film
R968	80.5269	47Kohm 5% Carbon film
R969	80.5269	47Kohm 5% Carbon film
R974	80.5259	6.8Kohm 5% Carbon film
R975	80.5259	6.8Kohm 5% Carbon film
R980	80.5258	5.6Kohm 5% Carbon film
R981	80.5258	5.6Kohm 5% Carbon film
R986	80.5242	270ohm 5% Carbon film

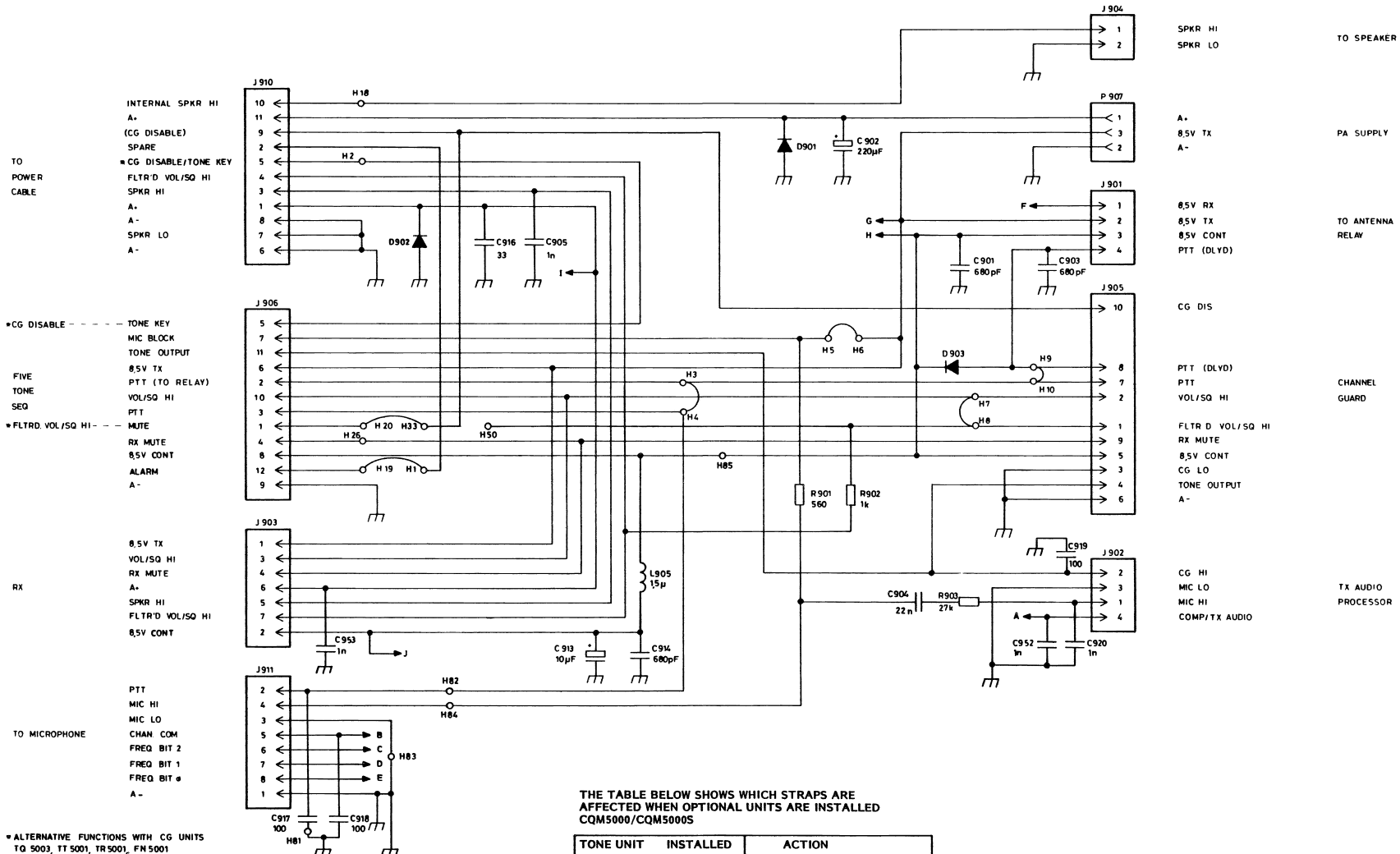
Storno

N ^o	CODE	DATA
R987	80.5242	270ohm 5% Carbon film
R992	80.5237	100ohm 5% Carbon film
R993	80.5242	270ohm 5% Carbon film
R994	80.5255	3.3Kohm 5% Carbon film
R995	80.5259	6.8Kohm 5% Carbon film
R996	80.5227	15ohm 5% Carbon film
R997	80.5251	1.5ohm 5% Carbon film
R998	80.5265	22Kohm 5% Carbon film
R999	80.5233	47ohm 5% Carbon film

CHANNEL SWITCH XS5661

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TO POWER CABLE

•CG DISABLE --- TONE KEY
 FIVE TONE SEQ --- MIC BLOCK
 •FLTRD. VOL/SQ HI --- TONE OUTPUT
 8.5V TX
 PTT (TO RELAY)
 VOL/SQ HI
 PTT
 MUTE
 RX MUTE
 8.5V CONT
 ALARM
 A-

RX

TO MICROPHONE

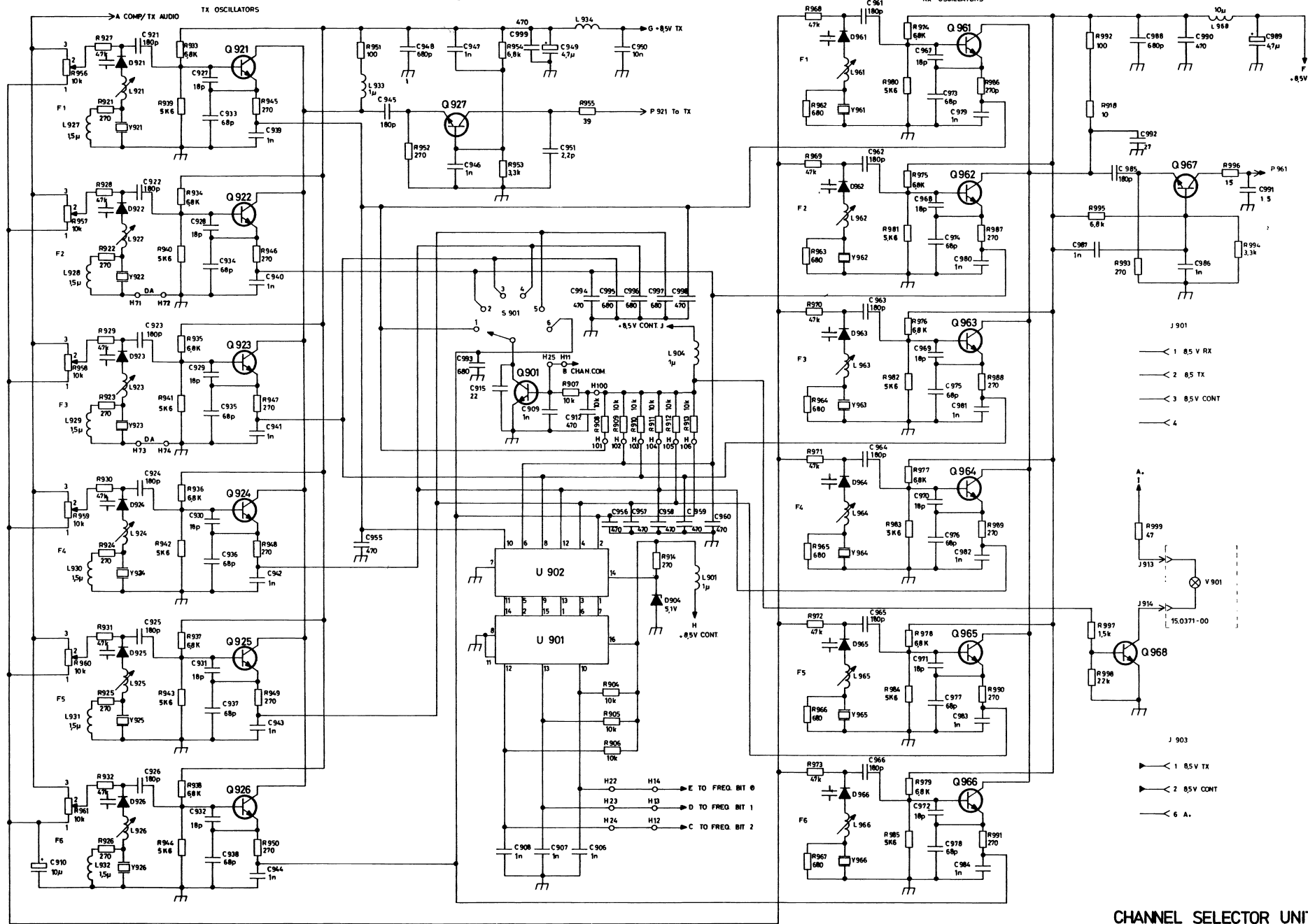
• ALTERNATIVE FUNCTIONS WITH CG UNITS
 TQ 5003, TT 5001, TR 5001, FN 5001

THE TABLE BELOW SHOWS WHICH STRAPS ARE AFFECTED WHEN OPTIONAL UNITS ARE INSTALLED
 CQM5000/CQM5000S

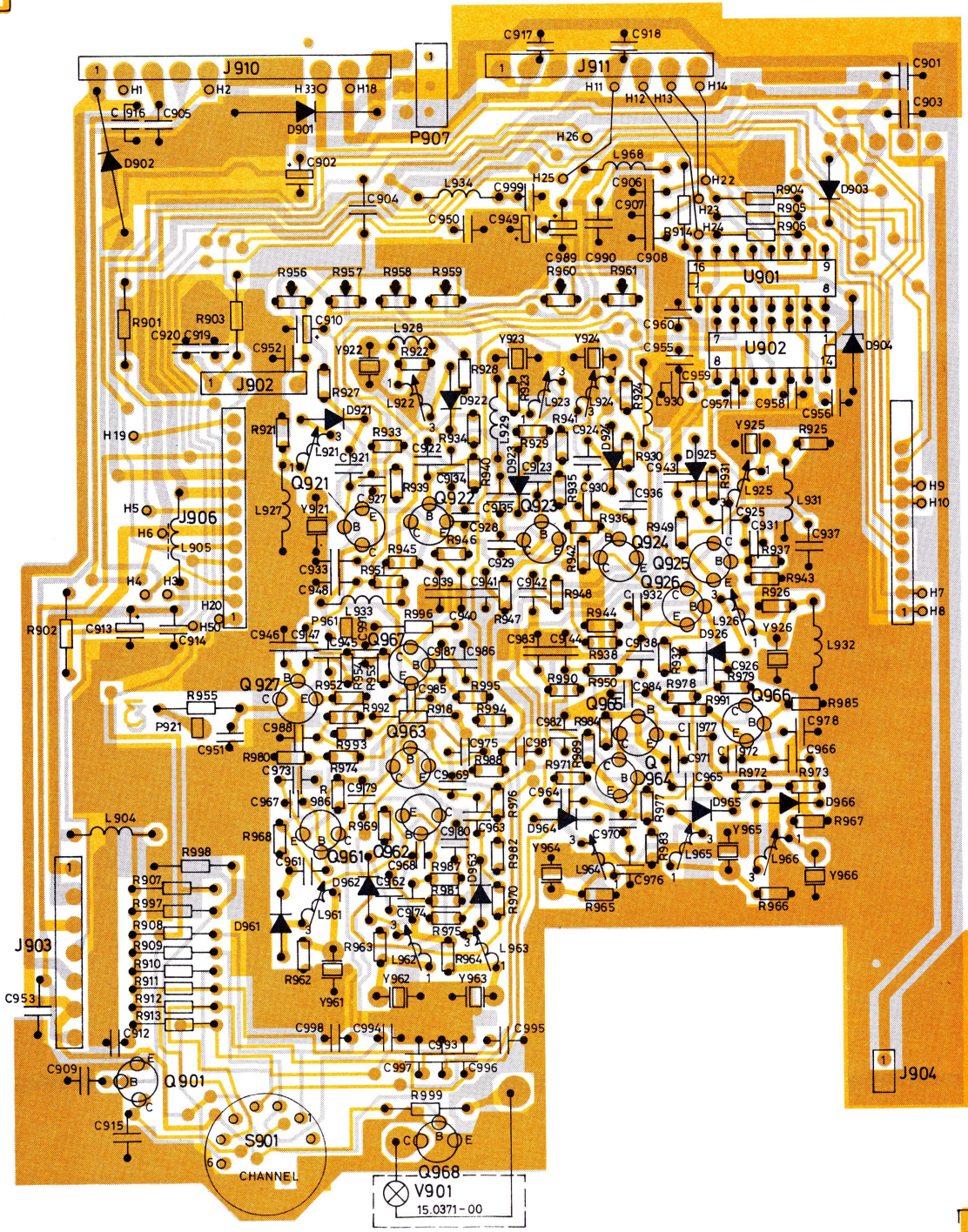
TO	UNIT	INSTALLED	ACTION
TO POWER CABLE	TQ5001	TQ5002	CUT H3-H4, H5-H6
	TQ5004	TQ5005	
	CL5001		
	TQ5006		CUT H7-H8, H9-H10, H20-H33
	TR5002	FN5002	CUT H7-H8, H20-H33
	TT5002		CUT H9-H10, H20-H33

CHANNEL SELECTOR UNIT
 XS 5662

D402.664/2



CHANNEL SELECTOR UNIT XS 5662
OSCILLATOR SECTION



CHANNEL SELECTOR UNIT XS 5662

D402.691

Storno

NO	CODE	DATA
C901	74.5396	680pF 20% Ceramic DI
C902	73.5165	220uF -10%/+100% Elco
C903	74.5396	680pF 20% Ceramic DI
C904	76.5141	22nF 5% Polyester FL
C905	74.5397	1nF 20% Ceramic DI
C906	74.5397	1nF 20% Ceramic DI
C907	74.5397	1nF 20% Ceramic DI
C908	74.5397	1nF 20% Ceramic DI
C909	74.5397	1nF 20% Ceramic DI
C910	A701534P7	10uF 20% Tantal
C912	74.5395	470pF 5% Ceramic DI
C913	A701534P7	10uF 20% Tantal
C914	74.5396	680pF 20% Ceramic DI
C915	74.5375	22pF 5% Ceramic DI
C916	74.5377	33pF 5% Ceramic DI
C917	74.5391	100pF 20% Ceramic DI
C918	74.5391	100pF 20% Ceramic DI
C919	74.5391	100pF 20% Ceramic DI
C920	74.5391	100pF 20% Ceramic DI
C921	74.5386	180pF 5% Ceramic DI
C922	74.5386	180pF 5% Ceramic DI
C923	74.5386	180pF 5% Ceramic DI
C924	74.5386	180pF 5% Ceramic DI
C925	74.5386	180pF 5% Ceramic DI
C926	74.5386	180pF 5% Ceramic DI
C927	74.5403	18pF 5% Ceramic DI
C928	74.5403	18pF 5% Ceramic DI
C929	74.5403	18pF 5% Ceramic DI
C930	74.5403	18pF 5% Ceramic DI
C931	74.5403	18pF 5% Ceramic DI
C932	74.5403	18pF 5% Ceramic DI
C933	74.5405	68pF 5% Ceramic DI
C934	74.5405	68pF 5% Ceramic DI
C935	74.5405	68pF 5% Ceramic DI
C936	74.5405	68pF 5% Ceramic DI
C937	74.5405	68pF 5% Ceramic DI
C938	74.5405	68pF 5% Ceramic DI
C939	74.5397	1nF 20% Ceramic DI
C940	74.5397	1nF 20% Ceramic DI
C941	74.5397	1nF 20% Ceramic DI
C942	74.5397	1nF 20% Ceramic DI
C943	74.5397	1nF 20% Ceramic DI

Storno

NO	CODE	DATA
C944	74.5397	1nF 20% Ceramic DI
C945	74.5386	180pF 5% Ceramic DI
C946	74.5397	1nF 20% Ceramic DI
C947	74.5397	1nF 20% Ceramic DI
C948	74.5396	680pF 20% Ceramic DI
C949	A701534P6	4.7uF 20% Tantal
C950	A700234P7	10nF 10% Polyester FL
C951	74.5363	2.2pF 0.25pF Ceramic D
C952	74.5391	100pF 20% Ceramic DI
C953	74.5397	1nF 20% Ceramic DI
C955	74.5395	470pF 5% Ceramic DI
C956	74.5395	470pF 5% Ceramic DI
C957	74.5395	470pF 5% Ceramic DI
C958	74.5395	470pF 5% Ceramic DI
C959	74.5395	470pF 5% Ceramic DI
C960	74.5395	470pF 5% Ceramic DI
C961	74.5386	180pF 5% Ceramic DI
C962	74.5386	180pF 5% Ceramic DI
C963	74.5386	180pF 5% Ceramic DI
C964	74.5386	180pF 5% Ceramic DI
C965	74.5386	180pF 5% Ceramic DI
C966	74.5386	180pF 5% Ceramic DI
C967	74.5403	18pF 5% Ceramic DI
C968	74.5403	18pF 5% Ceramic DI
C969	74.5403	18pF 5% Ceramic DI
C970	74.5403	18pF 5% Ceramic DI
C971	74.5403	18pF 5% Ceramic DI
C972	74.5403	18pF 5% Ceramic DI
C973	74.5405	68pF 5% Ceramic DI
C974	74.5405	68pF 5% Ceramic DI
C975	74.5405	68pF 5% Ceramic DI
C976	74.5405	68pF 5% Ceramic DI
C977	74.5405	68pF 5% Ceramic DI
C978	74.5405	68pF 5% Ceramic DI
C979	74.5397	1nF 20% Ceramic DI
C980	74.5397	1nF 20% Ceramic DI
C981	74.5397	1nF 20% Ceramic DI
C982	74.5397	1nF 20% Ceramic DI
C983	74.5397	1nF 20% Ceramic DI
C984	74.5397	1nF 20% Ceramic DI
C985	74.5386	180pF 5% Ceramic DI
C986	74.5397	1nF 20% Ceramic DI

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Nº	CODE	DATA
C987	74.5397	1nF 20% Ceramic DI
C988	74.5396	680pF 20% Ceramic DI
C989	A701534P6	4.7uF 20% Tantal
C990	74.5395	470pF 5% Ceramic DI
C991	74.5361	1.5pF 0.25pF Ceramic D
C992	74.5376	27pF 5% Ceramic
C993	74.5396	680pF 20% Ceramic DI
C994	74.5395	470pF 5% Ceramic DI
C995	74.5396	680pF 20% Ceramic DI
C996	74.5396	680pF 20% Ceramic DI
C997	74.5396	680pF 20% Ceramic DI
C998	74.5395	470pF 5% Ceramic DI
C999	74.5395	470pF 5% Ceramic DI
D901	99.5220	1N5401 Diode
D902	99.5220	1N5401 Diode
D903	99.5237	114148 Diode
D904	99.5346	5.1V 5% Zenerdiode
D921	J706262P1	Varicap
D922	J706262P1	Varicap
D923	J706262P1	Varicap
D924	J706262P1	Varicap
D925	J706262P1	Varicap
D926	J706262P1	Varicap
D961	J706262P1	Varicap
D962	J706262P1	Varicap
D963	J706262P1	Varicap
D964	J706262P1	Varicap
D965	J706262P1	Varicap
D966	J706262P1	Varicap
J901	41.0228	Male connector
J902	41.0228	Male connector
J903	41.0229	Male connector
J904	41.0225	Male connector
J905	41.0245	Male connector
J906	41.0227	Male connector
J907	41.5545	Fem. connector
J910	41.0232	Male connector
J911	41.0231	Male connector
L901	61.5029	1uH RF choke
L904	61.5029	1.0uH RF choke
L905	61.5030	1.5uH RF choke
L921	J706029P4	45-55MHz RF coil

Nº	CODE	DATA
L922	J706029P4	45-55MHz RF coil
L923	J706029P4	45-55MHz RF coil
L924	J706029P4	45-55MHz RF coil
L925	J706029P4	45-55MHz RF coil
L926	J706029P4	45-55MHz RF coil
L927	61.5030	1.5uH RF choke
L928	61.5030	1.5uH RF choke
L929	61.5030	1.5uH RF choke
L930	61.5030	1.5uH RF choke
L931	61.5030	1.5uH RF choke
L932	61.5030	1.5uH RF choke
L933	61.5029	1uH RF choke
L934	61.5031	10uH RF choke
L961	J706029P4	45-55MHz RF coil
L962	J706029P4	45-55MHz RF coil
L963	J706029P4	45-55MHz RF coil
L964	J706029P4	45-55MHz RF coil
L965	J706029P4	45-55MHz RF coil
L966	J706029P4	45-55MHz RF coil
L968	61.5031	10uH RF choke
P921	41.5550	Pin connector
P961	41.5550	Pin connector
Q901	99.5121	BC237 Transistor
Q921	99.5347	PI2369A Transistor
Q922	99.5347	PI2369A Transistor
Q923	99.5347	PI2369A Transistor
Q924	99.5347	PI2369A Transistor
Q925	99.5347	PI2369A Transistor
Q926	99.5347	PI2369A Transistor
Q927	99.5347	PI2369A Transistor
Q961	99.5347	PI2369A Transistor
Q962	99.5347	PI2369A Transistor
Q963	99.5347	PI2369A Transistor
Q964	99.5347	PI2369A Transistor
Q965	99.5347	PI2369A Transistor
Q966	99.5347	PI2369A Transistor
Q967	99.5347	PI2369A Transistor
Q968	99.5121	BC237 Transistor
R901	80.5246	560ohm 5% Carbon film
R902	80.5249	1Kohm 5% Carbon film
R903	80.5266	27Kohm 5% Carbon film
R904	80.5261	10Kohm 5% Carbon film

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N _o	CODE	DATA
R905	80.5261	10Kohm 5% Carbon film 1/8W
R906	80.5261	10Kohm 5% Carbon film 1/8W
R907	80.5261	10Kohm 5% Carbon film 1/8W
R908	80.5261	10Kohm 5% Carbon film 1/8W
R909	80.5261	10Kohm 5% Carbon film 1/8W
R910	80.5261	10Kohm 5% Carbon film 1/8W
R911	80.5261	10Kohm 5% Carbon film 1/8W
R912	80.5261	10Kohm 5% Carbon film 1/8W
R913	80.5261	10Kohm 5% Carbon film 1/8W
R914	80.5242	270ohm 5% Carbon film 1/8W
R918	80.5225	10ohm 5% Carbon film 1/8W
R921	80.5242	270ohm 5% Carbon film 1/8W
R922	80.5242	270ohm 5% Carbon film 1/8W
R923	80.5242	270ohm 5% Carbon film 1/8W
R924	80.5242	270ohm 5% Carbon film 1/8W
R925	80.5242	270ohm 5% Carbon film 1/8W
R926	80.5242	270ohm 5% Carbon film 1/8W
R927	80.5269	47Kohm 5% Carbon film 1/8W
R928	80.5269	47Kohm 5% Carbon film 1/8W
R929	80.5269	47Kohm 5% Carbon film 1/8W
R930	80.5269	47Kohm 5% Carbon film 1/8W
R931	80.5269	47Kohm 5% Carbon film 1/8W
R932	80.5269	47Kohm 5% Carbon film 1/8W
R933	80.5259	6.8Kohm 5% Carbon film 1/8W
R934	80.5259	6.8Kohm 5% Carbon film 1/8W
R935	80.5259	6.8Kohm 5% Carbon film 1/8W
R936	80.5259	6.8Kohm 5% Carbon film 1/8W
R937	80.5259	6.8Kohm 5% Carbon film 1/8W
R938	80.5259	6.8Kohm 5% Carbon film 1/8W
R939	80.5258	5.6Kohm 5% Carbon film 1/8W
R940	80.5258	5.6Kohm 5% Carbon film 1/8W
R941	80.5258	5.6Kohm 5% Carbon film 1/8W
R942	80.5258	5.6Kohm 5% Carbon film 1/8W
R943	80.5258	5.6Kohm 5% Carbon film 1/8W
R944	80.5258	5.6Kohm 5% Carbon film 1/8W
R945	80.5242	270ohm 5% Carbon film 1/8W
R946	80.5242	270ohm 5% Carbon film 1/8W
R947	80.5242	270ohm 5% Carbon film 1/8W
R948	80.5242	270ohm 5% Carbon film 1/8W
R949	80.5242	270ohm 5% Carbon film 1/8W
R950	80.5242	270ohm 5% Carbon film 1/8W
R951	80.5237	100ohm 5% Carbon film 1/8W

N _o	CODE	DATA
R952	80.5242	270ohm 5% Carbon film 1/8W
R953	80.5255	3.3Kohm 5% Carbon film 1/8W
R954	80.5259	6.8Kohm 5% Carbon film 1/8W
R955	80.5232	39ohm 5% Carbon film 1/8W
R956	86.5079	10Kohm 10% Trim Cermet 1/2W
R957	86.5079	10Kohm 10% Trim Cermet 1/2W
R958	86.5079	10Kohm 10% Trim Cermet 1/2W
R959	86.5079	10Kohm 10% Trim Cermet 1/2W
R960	86.5079	10Kohm 10% Trim Cermet 1/2W
R961	86.5079	10Kohm 10% Trim Cermet 1/2W
R962	80.5247	680ohm 5% Carbon film 1/8W
R963	80.5247	680ohm 5% Carbon film 1/8W
R964	80.5247	680ohm 5% Carbon film 1/8W
R965	80.5247	680ohm 5% Carbon film 1/8W
R966	80.5247	680ohm 5% Carbon film 1/8W
R967	80.5247	680ohm 5% Carbon film 1/8W
R968	80.5269	47Kohm 5% Carbon film 1/8W
R969	80.5269	47Kohm 5% Carbon film 1/8W
R970	80.5269	47Kohm 5% Carbon film 1/8W
R971	80.5269	47Kohm 5% Carbon film 1/8W
R972	80.5269	47Kohm 5% Carbon film 1/8W
R973	80.5269	47Kohm 5% Carbon film 1/8W
R974	80.5259	6.8Kohm 5% Carbon film 1/8W
R975	80.5259	6.8Kohm 5% Carbon film 1/8W
R976	80.5259	6.8Kohm 5% Carbon film 1/8W
R977	80.5259	6.8Kohm 5% Carbon film 1/8W
R978	80.5259	6.8Kohm 5% Carbon film 1/8W
R979	80.5259	6.8Kohm 5% Carbon film 1/8W
R980	80.5258	5.6Kohm 5% Carbon film 1/8W
R981	80.5258	5.6Kohm 5% Carbon film 1/8W
R982	80.5258	5.6Kohm 5% Carbon film 1/8W
R983	80.5258	5.6Kohm 5% Carbon film 1/8W
R984	80.5258	5.6Kohm 5% Carbon film 1/8W
R985	80.5258	5.6Kohm 5% Carbon film 1/8W
R986	80.5242	270ohm 5% Carbon film 1/8W
R987	80.5242	270ohm 5% Carbon film 1/8W
R988	80.5242	270ohm 5% Carbon film 1/8W
R989	80.5242	270ohm 5% Carbon film 1/8W
R990	80.5242	270ohm 5% Carbon film 1/8W
R991	80.5242	270ohm 5% Carbon film 1/8W
R992	80.5237	100ohm 5% Carbon film 1/8W
R993	80.5242	270ohm 5% Carbon film 1/8W

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Storno

Nº	CODE	DATA
R994	80.5255	3.3Kohm 5% Carbon film 1/8W
R995	80.5259	6.8Kohm 5% Carbon film 1/8W
R996	80.5227	15ohm 5% Carbon film 1/8W
R997	80.5251	1.5ohm 5% Carbon film 1/8W
R998	80.5265	22Kohm 5% Carbon film 1/8W
R999	80.5233	47ohm 5% Carbon film 1/8W
U901	14.5133	4028 BOD/DEC decoder
U902	14.5025	6405N Hex. inverter O.C.

Storno

Nº	CODE	DATA

CHANNEL SWITCH XS5662

X402.689/2

TECHNICAL SPECIFICATIONS

CQM5660

Guaranteed performance specifications unless otherwise noted.

Typical values are given in brackets.

GENERAL

Frequency Range

420 - 470MHz

Channel Separation

CQM5662: 30/25kHz

CQM5663: 20kHz

Maximum Frequency Deviation

CQM5662: ± 5 kHz

CQM5663: ± 4 kHz

Modulation Frequency Range

300 - 3000Hz

Maximum RF Bandwidth

RX: 3.0MHz

TX: 5.5MHz

Antenna Impedance

50 ohm

Maximum Number of Channels

6

Supply Voltage

Minimum: 10.8V

Nominal: 13.2V

Maximum: 16.6V

Negative potential to chassis

Temperature Range

-30°C to +60°C

Dimensions

B x D x H: 180 x 190 x 60mm

Weight

1.8 Kg

RECEIVER

Sensitivity

12dB SINAD (EIA), $\frac{1}{2}$ e. m. f.

0.4uV (0.3uV)

Measuring conditions:

$\Delta f \pm \frac{2}{3} \times \Delta f_{max}$; $f_{mod} = 1$ kHz

20dB SINAD (CEPT) e. m. f.

1.0uV (0.7uV)

$\Delta F 60\% \times \Delta f_{max}$; $f_{mod} = 1$ kHz.

Measured with psophometric filter.

Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$$420 - 440\text{MHz: } f_x = \frac{F_s + 21.4}{9} \text{ MHz}$$

$$440.025 - 449.975\text{MHz: } f_x = \frac{F_s \pm 21.4}{9} \text{ MHz}$$

$$450 - 470\text{MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

Frequency Stability

Conforms with government regulations

Modulation Acceptance Bandwidth (EIA)

±7kHz (±7.5kHz)

Adjacent Channel Selectivity

EIA

75dB

CEPT

75dB

Spurious Rejection

EIA

85dB

Intermodulation Attenuation

EIA

70dB

CEPT

70dB (78dB)

FTZ

70dB

Blocking

90dB/uV (100dB/uV)

Radiation

Conducted: max 0.8nW

Radiated: max. 0.8nW

AF Load Impedance (Loudspeaker)

4 ohm

AF Power Output

EIA: 3W (3.6W)

CEPT: 1.5W

AF Distortion

5% (1.5%)

 $\Delta f = 60\% \Delta f \text{ max.}, 1\text{kHz}, 1\text{W}, \text{RF } 1\text{mV}$ Audio Frequency Response, CEPT/FTZ

+1/-3dB (+0/-1.5dB)

Relative to 1000Hz, -6dB/octave

fm: 300 - 3000Hz

400 - 2700Hz 0/-1dB

Hum and Noise

Squelched : 80dB (better than 85dB)

Unsquelched : 55dB (60dB)

Squelch Recovery Time

250 ms (110 ms)

Squelch Attack Time, EIA

150 ms (50 ms)

Squelch Closing Time, EIA

150 ms (20 ms)

Current Consumption

Squelched: 150mA (130mA)

AF 2W : 500mA (450mA)

(1 channel, without tone equipment, 13.2V supply)

TRANSMITTERRF Power Output

CQM5660-5W: 5W

CQM5660-20W: 20W

 $R_L = 50 \text{ ohm}$ Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s}{9}$$

Frequency Stability

Conforms with government regulations

Undesired Radiation

max. 0.2uW

Sideband Noise Power, CEPT

less than 70dB

AF Input Impedance

560 ohm

Modulation Sensitivity

70mV \pm 2dB

(60% Δ F max, 1kHz)

Modulation Response

300 - 3000Hz

+1/-3.0dB (+0.5/-2dB)

relative to 1000Hz, 6dB/octave

400 - 2700Hz

+1/-1.5dB (+0.5/-1dB) relative to 1000Hz,
6dB/octave

Modulation Distortion

fm = 1000Hz: max. 3%

Δ f = \pm 3.0kHz

fm = 300Hz: max. 5%

Δ f = \pm 0.9kHz

measured with 750u sec de-emphasis

FM Hum and Noise

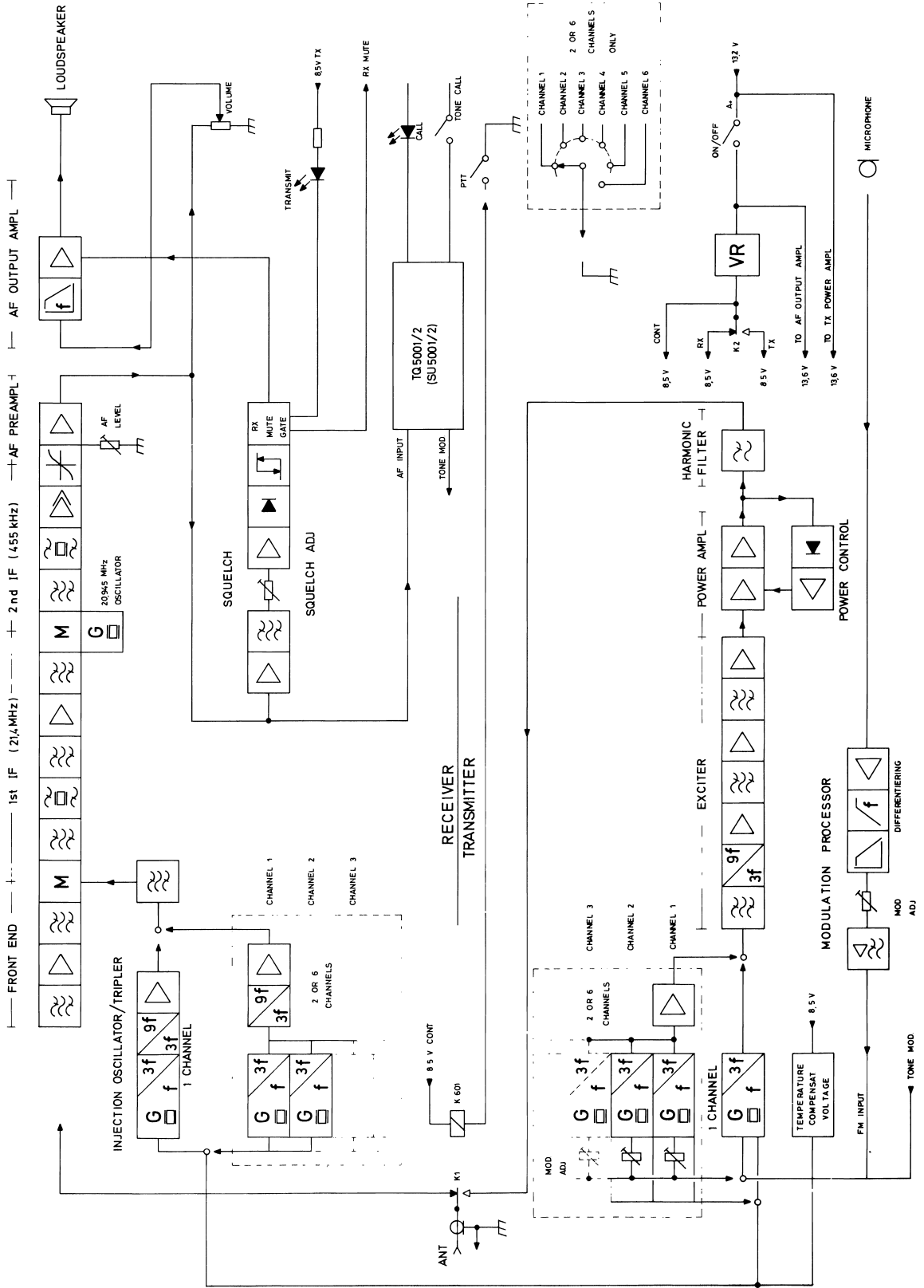
70dB

CEPT (measured with 750 usec de-emphasis)
and psophometric filter.

Current Consumption

5W: less than 1.5A (1.5A)

20W: less than 5.5A (5.0A)



FUNCTIONAL BLOCK DIAGRAM
CQM 5660

D.402.673

TECHNICAL SPECIFICATIONS

CQM5664

Guaranteed performance specifications unless otherwise noted.

Typical values are given in brackets.

GENERAL

Frequency Range

420 - 470 MHz

Channel Separation

12.5 kHz

Maximum Frequency Deviation

±2.5 kHz

Modulation Frequency Range

300 - 2550 Hz

Maximum RF Bandwidth

RX: 3.0 MHz

TX: 5.5 MHz

Antenna Impedance

50 ohm

Maximum Number of Channels

1

Supply Voltage

Minimum: 10.8 V

Nominal: 13.2 V

Maximum: 16.6 V

Negative potential to chassis

Temperature Range

-30°C to +60°C

Dimensions

B x D x H: 180 x 190 x 60mm

Weight

1.8 Kg

RECEIVER

Sensitivity

12 dB SINAD (EIA), $\frac{1}{2}$ e.m.f.

0.5 uV

Measuring conditions:

$\Delta f \pm 2/3 \times \Delta f_{max}$; $f_{mod} = 1\text{kHz}$

20 dB SINAD (CEPT) e.m.f.

1.0uV (0.7uV)

$\Delta F 60\% \times \Delta f_{max}$; $f_{mod} = 1\text{kHz}$.

Measured with psophometric filter.

Crystal Frequency Range

46.5 - 52.4 MHz

Crystal Frequency Calculation (fx)

$$420 - 440 \text{ MHz: } f_x = \frac{F_s + 21.4}{9} \text{ MHz}$$

$$440.025 - 449.975 \text{ MHz: } f_x = \frac{F_s \pm 21.4}{9} \text{ MHz}$$

$$450 - 470 \text{ MHz: } f_x = \frac{F_s - 21.4}{9} \text{ MHz}$$

Frequency Stability

Conforms with government regulations

Modulation Acceptance Bandwidth (EIA)

±3.5 kHz

Adjacent Channel Selectivity

CEPT

70 dB (80 dB)

Intermodulation Attenuation

CEPT

70 dB (78 dB)

Blocking

90 dB/uV (100 dB/uV)

Radiation

Conducted: max 0.8 nW

Radiated: max. 0.8 nW

AF Load Impedance (Loudspeaker)

4 ohm

AF Power Output

3 W (3.6 W)

AF Distortion

5% (1.5%)

 $\Delta f = \pm 1.5 \text{ kHz}$, 1 kHz, 1 W, RF 1 mVAudio Frequency Response, CEPT

+1/-3 dB (+0/-1.5 dB)

Relative to 1000 Hz, -6 dB/octave

fm: 300 - 2550 Hz

Hum and Noise

Squelched: 80 dB (better than 85 dB)

Unsquelched: 55 dB (60 dB)

Squelch Recovery Time

250 ms (200 ms)

Squelch Attack Time, EIA

150 ms (110 ms)

Squelch Closing Time, EIA

150 ms (50 ms)

Current Consumption

Squelched: 150 mA (130 mA)

AF 2 W: 500 mA (450 mA)

(1 channel, without tone equipment, 13.2 V supply)

TRANSMITTER

RF Power Output

CQM5660-5 W: 5 W

CQM5660-20 W: 20 W

 $R_L = 50 \text{ ohm}$ Crystal Frequency Range

46.5 - 52.4 MHz

Crystal Frequency Calculation (fx)

$$f_x = \frac{F_s}{9}$$

Frequency Stability

Conforms with government regulations

Undesired Radiation

max. 0.2 uW

Sideband Noise Power, CEPT

CQM5664-5: less than 70dB

CQM5664-20: less than 60 dB

AF Input Impedance

560 ohm

Modulation Sensitivity

90 mV \pm 3 dB

($\Delta F = \pm 1.5$ kHz, 1 kHz)

Modulation Response (CEPT)

fm 300 - 2550 Hz

+1/-3 dB (+0.5/-2 dB)

relative to 1000 Hz, 6 dB/octave

Modulation Distortion (CEPT)

fm= 1000 Hz: max. 3%

fm= 300 Hz: max. 5%

$\Delta f = \pm 1.5$ kHz

FM Hum and Noise (CEPT)

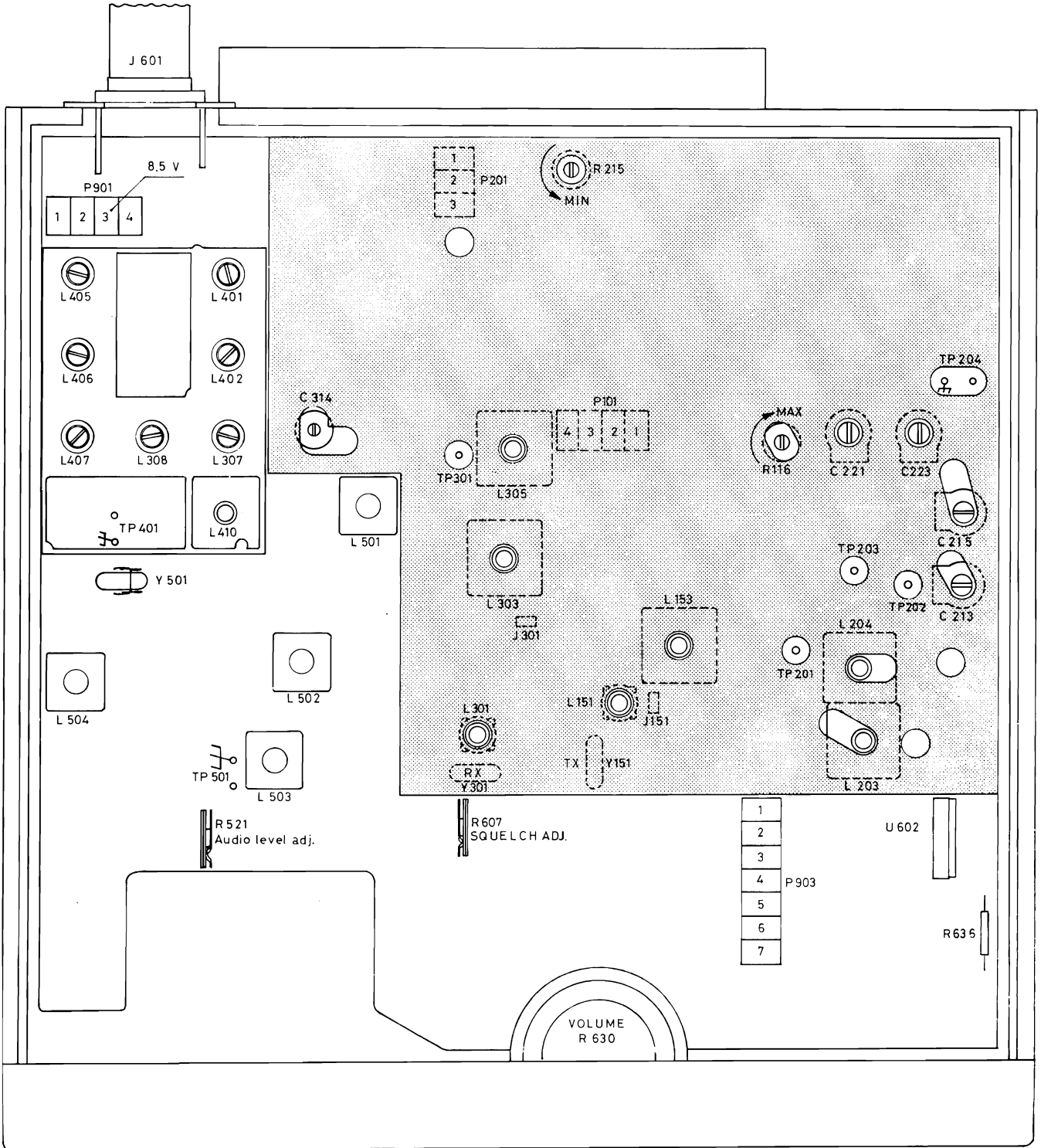
70 dB

measured with 750 usec de-emphasis and
psophometric filter.

Current Consumption

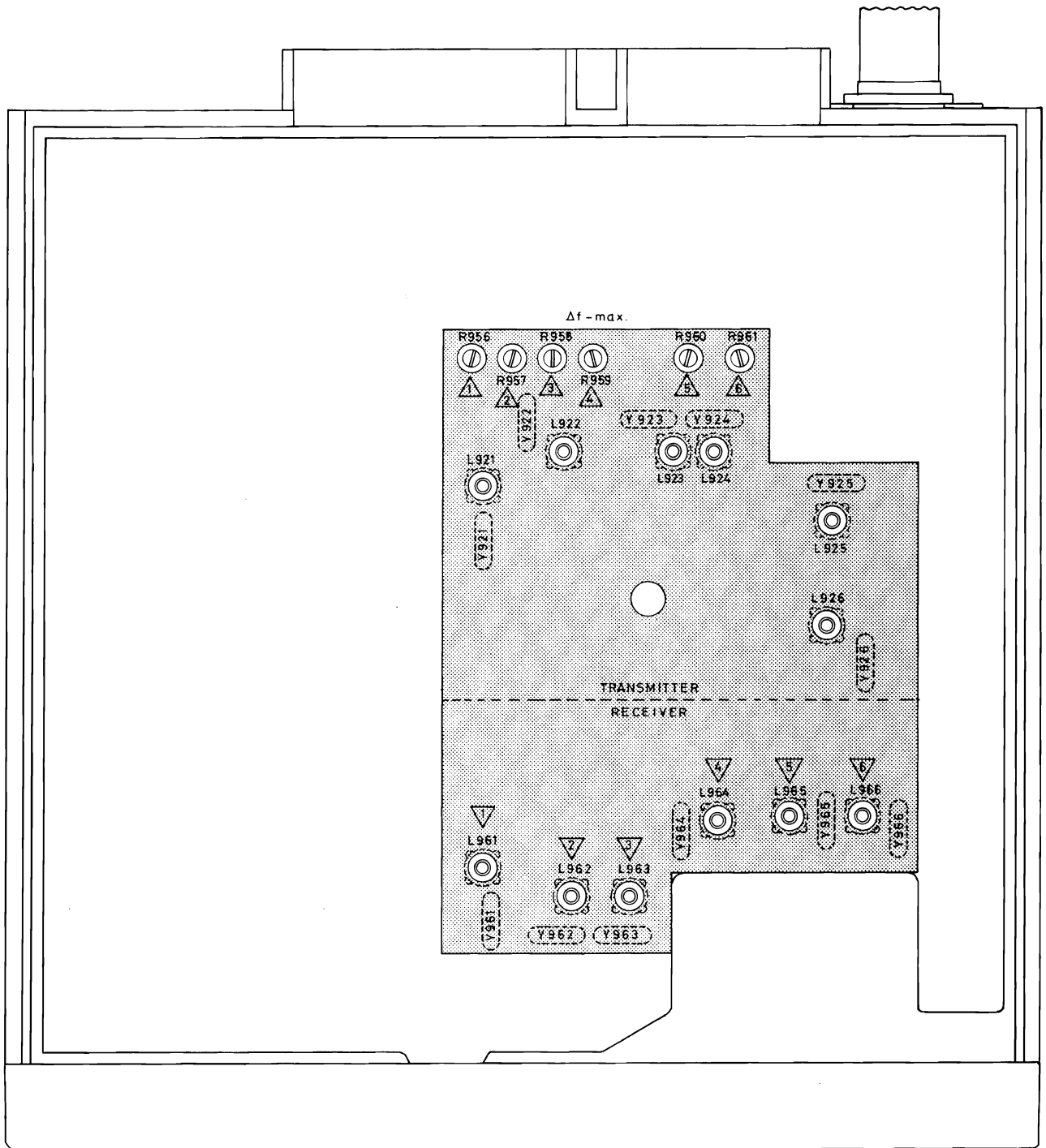
5 W: less than 1.8 A (1.5 A)

20 W: less than 5.5 A (5.0 A)



Storno

Storno



▽ = RECEIVER CHANNEL №

△ = TRANSMITTER CHANNEL №

ADJUSTABLE COMPONENTS AND TEST
POINTS ON XS5661/XS5662/
XS5551/XS5552 D402.671/2

NOTE 1
TO MODIFY FOR MULTI FREQUENCY
AND FOR TEMPERATURE COMPENSATED
OSCILLATORS REMOVE R157(DISABLE TX
OSC.) AND R309 (DISABLE RX OSC.)

NOTE 2
VALUE OF R 636 DEPENDS ON COLOR
MARK ON U602

U602	R636 VALUE
BROWN	OMIT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6.8

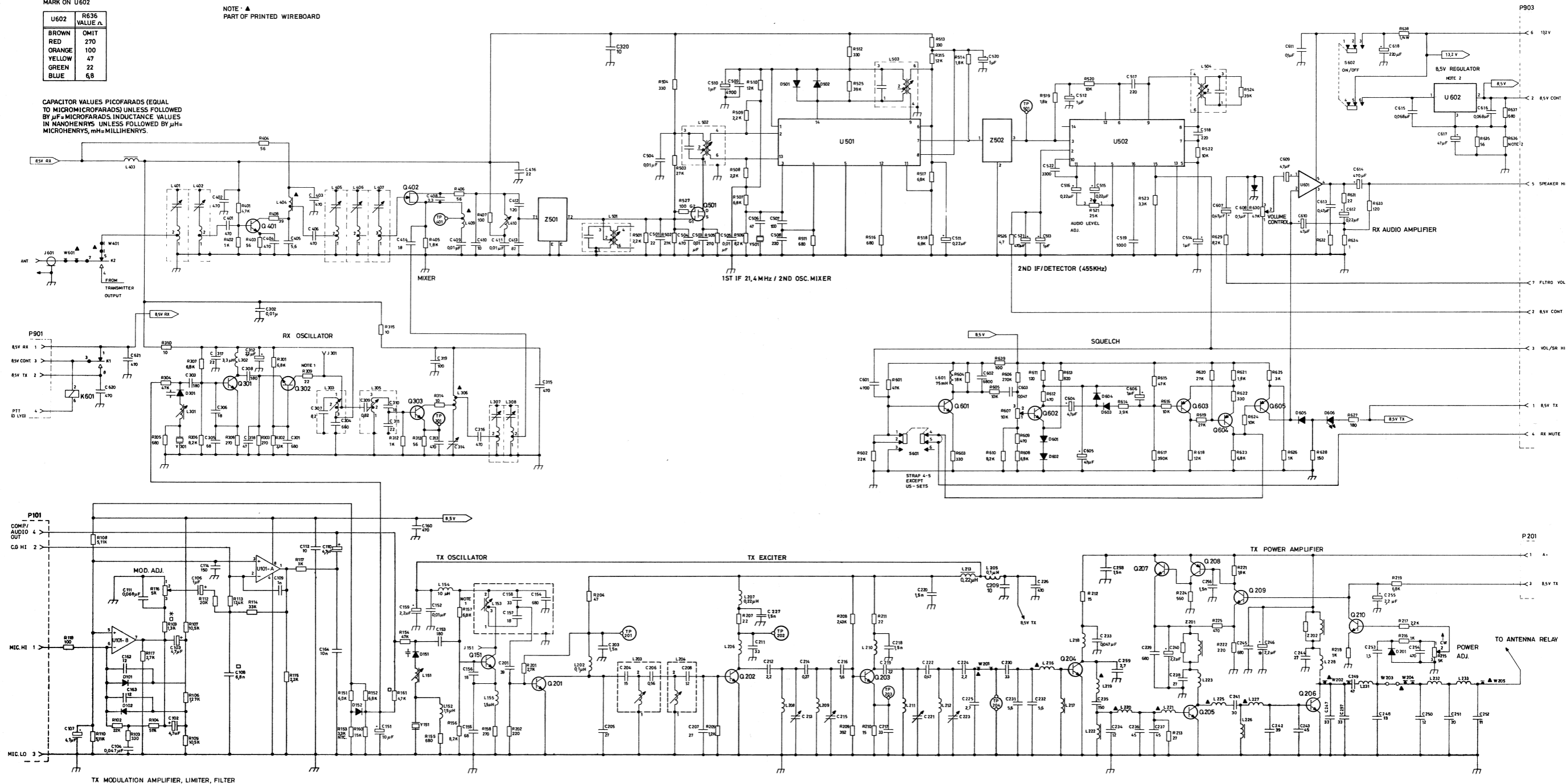
CAPACITOR VALUES PICOFARADS (EQUAL
TO MICROMICROFARADS) UNLESS FOLLOWED
BY μ F=MICROFARADS, INDUCTANCE VALUES
IN NANohenrys UNLESS FOLLOWED BY μ H=
MICROHENRYS, mH=MILLIHENRYS.

NOTE *
R109 =1.8K FOR SWEDEN

NOTE □
12.5 KHz UNITS (RF 5664)

R109 =1.8K
R161 = REMOVED
C108 = 10nF

NOTE ▲
PART OF PRINTED WIREBOARD



* COMPONENT VALUES

COMP	20W	5W
C243	45pF	—
C244	27pF	—
C247	33pF	—
C248	13pF	10pF
L226	63μH	—
L228	YES	—
L234	—	YES
Q206	YES	—
Z202	YES	—
C245	680pF	—
C246	22μF	—
C242	39pF	27pF
C257	33pF	—
C241	30pF	47pF

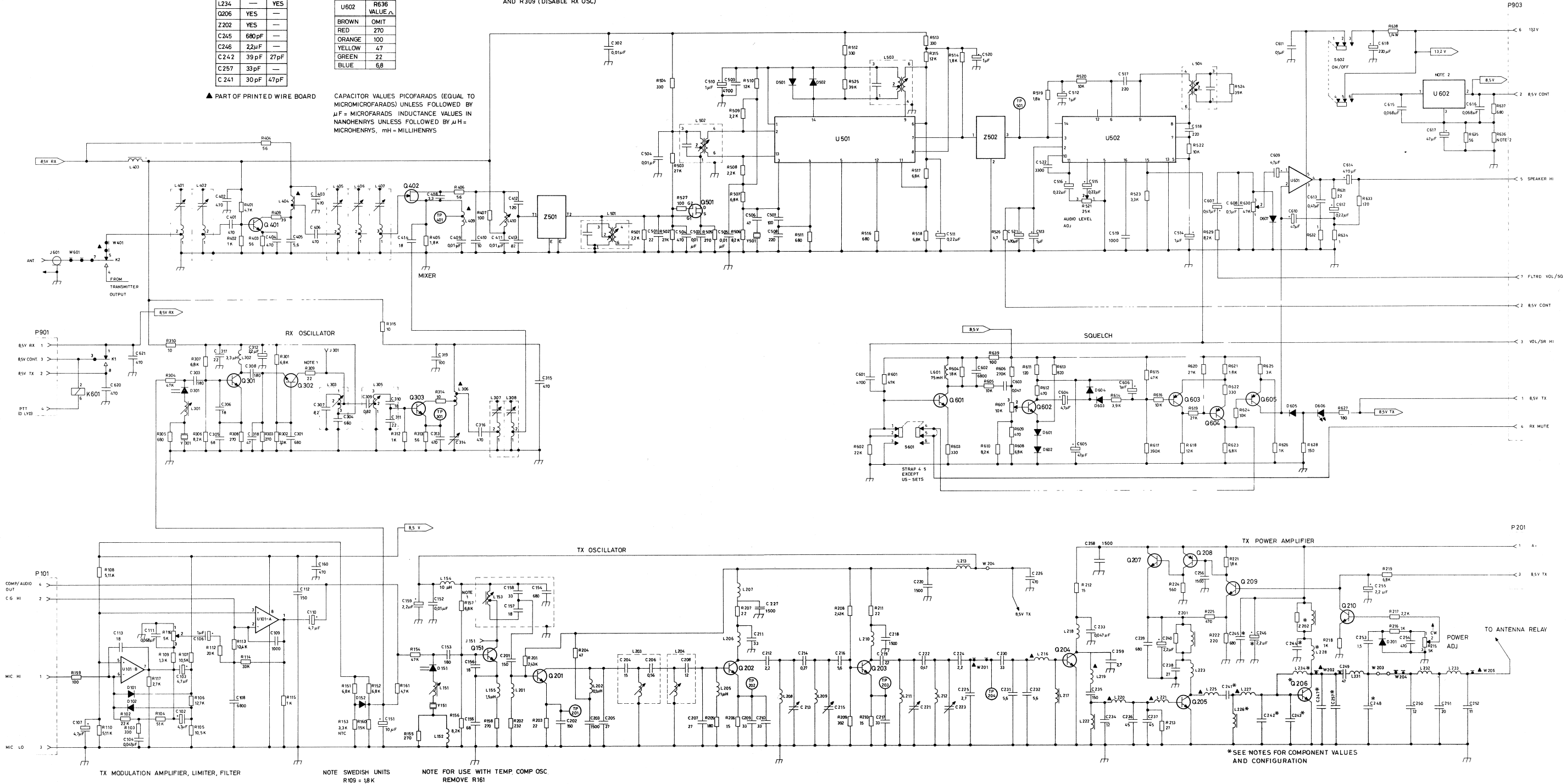
NOTE 2
VALUE OF R636 DEPENDS ON COLOR MARK ON U602

U602	R636 VALUE
BROWN	OMIT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6.8

NOTE 1
TO MODIFY FOR MULTI FREQUENCY AND FOR TEMPERATURE COMPENSATED OSCILLATORS REMOVE R157 (DISABLE TX OSC) AND R309 (DISABLE RX OSC)

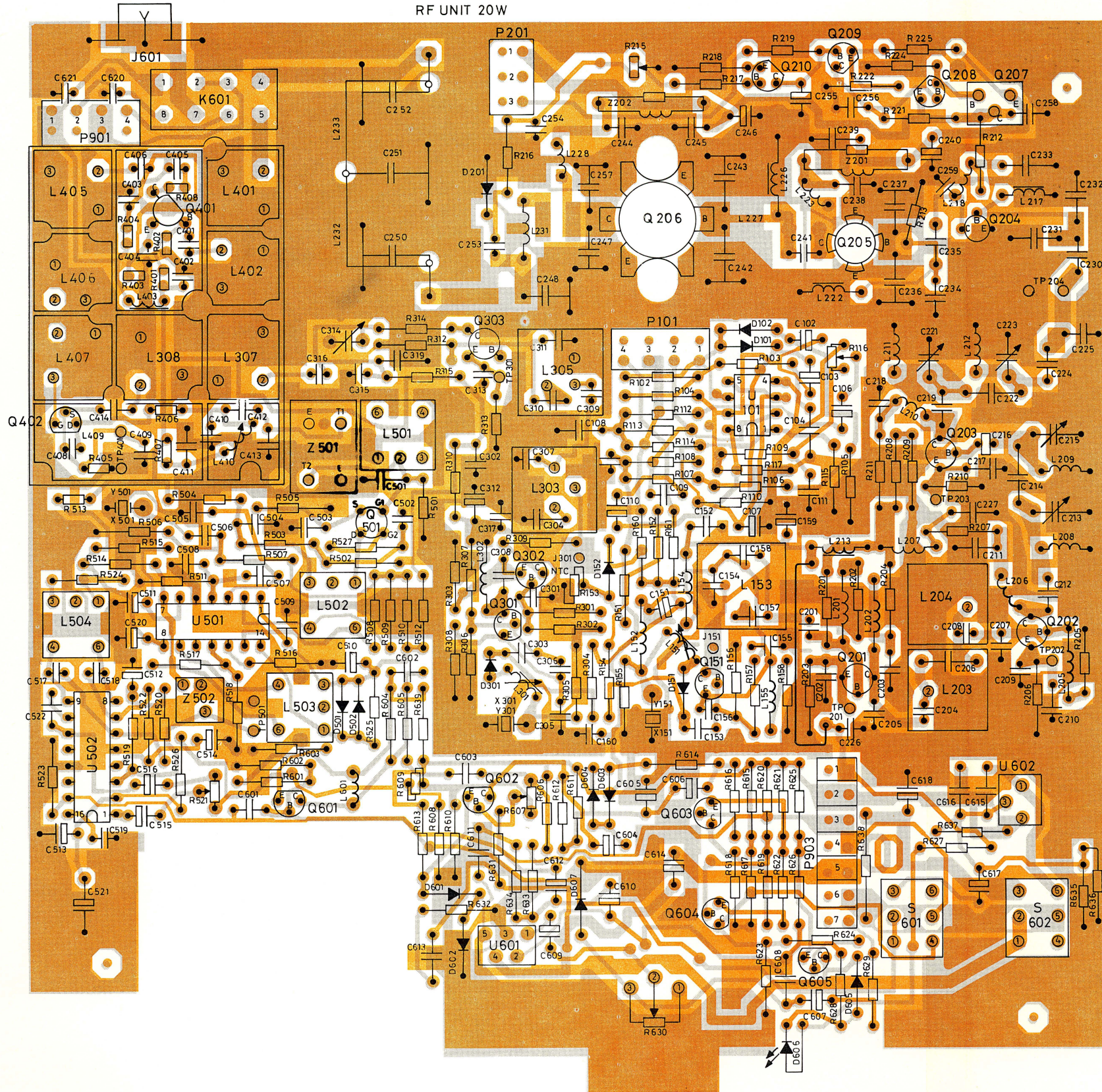
▲ PART OF PRINTED WIRE BOARD

CAPACITOR VALUES PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY μF = MICROFARADS INDUCTANCE VALUES IN NANOHENRYS UNLESS FOLLOWED BY μH = MICROHENRYS, mH = MILLIHENRYS

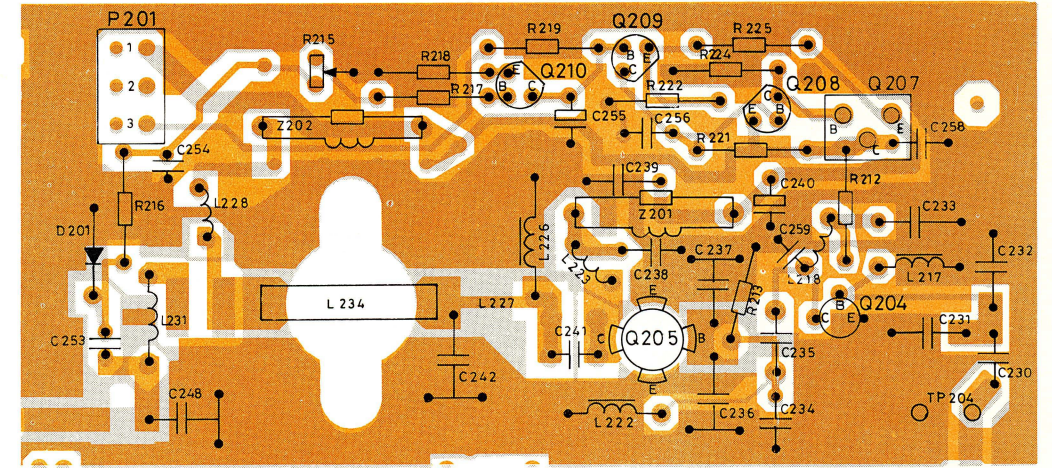


* SEE NOTES FOR COMPONENT VALUES AND CONFIGURATION

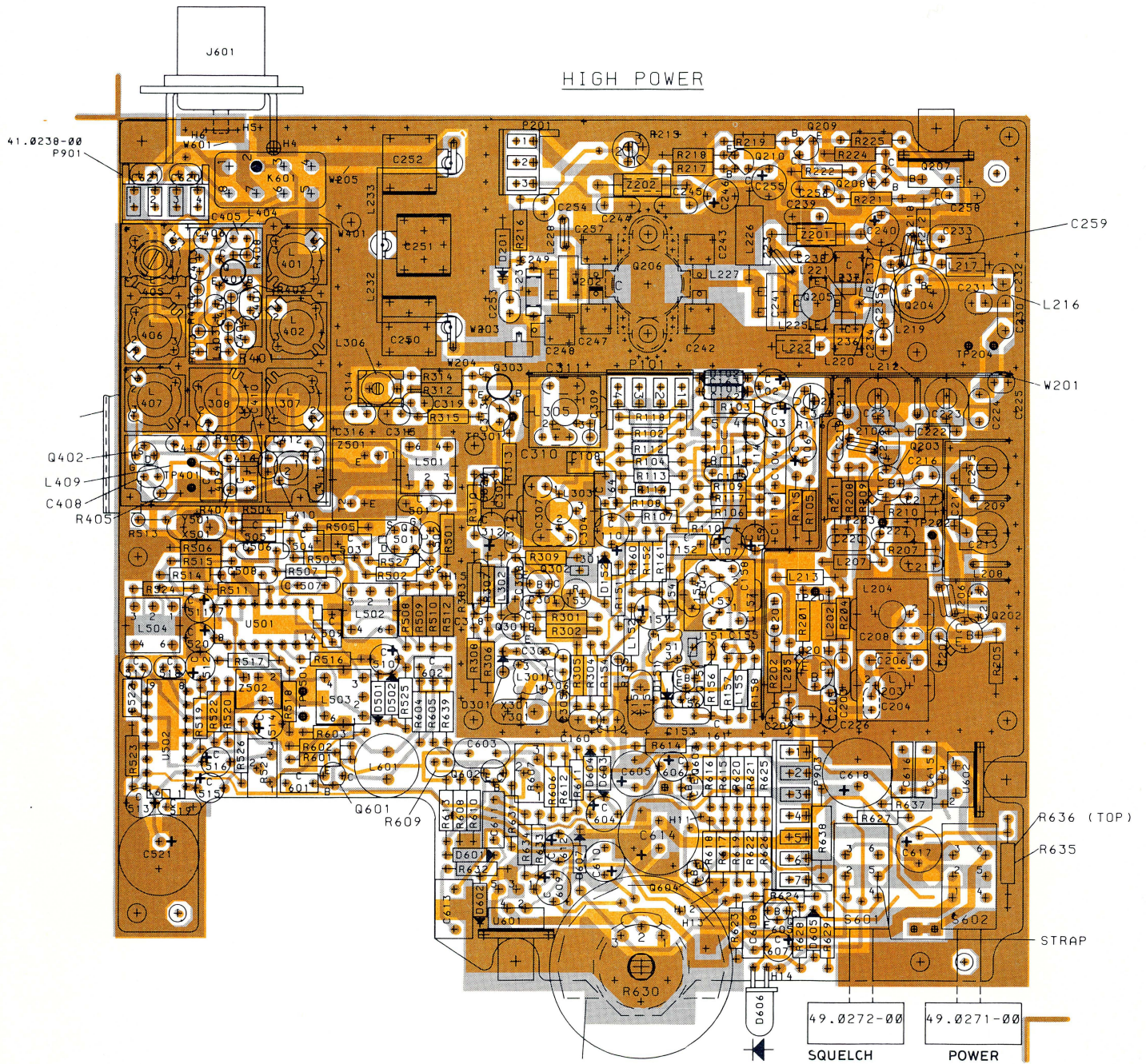
RF UNIT 20W



ONLY FOR RF 5660a
RF UNIT 5W



RF UNIT, RF5660a 20W & 5W
AND RF5550 20W



RF UNITS RF5660b, RF5550a
COMPONENT LAYOUT

D403.207

TYPE	Nº	CODE	DATA
	C102	73. 5172	4. 7uF 20% Tantal
	C103	73. 5172	4. 7uF 20% Tantal
	C104	76. 5142	47nF 5% Polyester FL
	C106	73. 5170	1. 0uF 20% Tantal
	C107	73. 5172	4. 7uF 20% Tantal
	C108	76. 5140	6. 8nF 5% Polyester FL
	C109	76. 5156	1nF 5% Polyester FL
	C110	73. 5172	4. 7uF 20% Tantal
	C111	76. 5151	68nF 5% Polyester FL
	C112	74. 5392	150pF 20% Ceram DI
	C113	74. 5374	18 pF 5% Ceram DI
	C114	74. 5392	150 pF 20% Ceramic DI2
	C151	73. 5173	10uF 20% Tantal
	C152	76. 5135	10nF 10% Polyester FL
	C153	74. 5386	180pF 5% Ceram DI
	C154	74. 5396	680pF 20% Ceram DI
	C155	74. 5405	68pF 5% Ceram DI
	C156	74. 5403	18pF 5% Ceram DI
	C157	74. 5374	18pF 5% Ceram DI
	C158	74. 5377	33pF 5% Ceram DI
	C159	73. 5171	2. 2uF 20% Tantal
	C160	74. 5395	470pF 20% Ceram DI
	C201	74. 5386	180pF 5% Ceram DI
	C202	74. 5414	150pF 20% Ceram DI
	C203	74. 5398	1. 5nF 20% Ceram DI
	C204	74. 5373	15pF 5% Ceram DI
	C205	74. 5376	27pF 5% Ceram DI
	C206	79. 5005	0. 56pF 5% Phenolic TB
	C207	74. 5376	27pF 5% Ceram DI
	C208	74. 5372	12pF 5% Ceram DI
	C209	74. 5377	33pF 5% Ceram DI
	C210	74. 5377	33pF 5% Ceram N150 DI
	C211	74. 5377	33pF 5% Ceram DI
	C212	74. 5413	2. 2pF 0. 1pF DI
	C213	78. 5065	2/10pF Air trimmer
	C214	79. 5002	0. 27pF 5% Phenolic TB
	C215	78. 5065	2/10pF Air trimmer
	C216	74. 5368	5. 6pF 0. 25pF Ceram DI
	C217	74. 5377	33pF 5% Ceram DI
	C218	74. 5398	1. 5nF 20% Ceram DI
	C219	74. 5413	2. 2pF 0. 1pF DI
	C220	74. 5398	1. 5nF 20% Ceram DI
	C221	78. 5065	2/10pF Air trimmer
	C222	79. 5004	0. 47pF 5% Phenolic TB
	C223	78. 5065	2/10pF Air trimmer
	C224	74. 5413	2. 2pF 0. 1pF DI
	C225	74. 5364	2. 7pF 0. 25pF Ceram DI

TYPE	Nº	CODE	DATA
	C226	74. 5395	470pF 20% Ceram DI
	C227	74. 5398	1. 5 nF 20% Ceramic 2DI
	C230	74. 5377	33pF 5% Ceram DI
	C231	74. 5368	5. 6pF 0. 25pF Ceram DI
	C232	74. 5368	5. 6pF 0. 25pF Ceram DI
	C233	76. 5139	47nF 10% Polyester FL
	C234	74. 5372	12pF 5% Ceram DI
	C235	74. 5414	150pF 20% Ceram DI
	C236	75. 5038	45pF 5% Mica
	C237	75. 5038	45pF 5% Mica
	C238	74. 5376	27pF 5% Ceram DI
	C239	74. 5396	680pF 20% Ceram DI
	C240	73. 5171	2. 2uF 20% Tantal
20 W	C241	75. 5025	30 pF 5% Teflon
5 W	C241	75. 5044	47 pF 2% Teflon
5 W	C242	75. 5052	27 pF 5% Mica
20 W	C242	75. 5054	39 pF 5% Mica
20 W	C243	75. 5038	45 pF 5% Mica
20W	C244	74. 5376	27pF 5% Ceram DI
20W	C245	74. 5396	680pF 20% Ceram DI
20W	C246	73. 5171	2. 2uF 20% Tantal
20 W	C247	75. 5053	33 pF 5% Mica
5W	C248	75. 5050	10 pF 5% Mica
20W	C248	75. 5051	13 pF 5% Mica
	C249	75. 5044	47 pF 2% Teflon
	C250	75. 5034	12pF 0. 5pF Teflon
	C251	75. 5036	20pF 0. 5pF Teflon
	C252	75. 5035	11pF 0. 5pF Teflon
	C253	74. 5361	1. 5pF 0. 25pF Ceram DI
20W	C254	74. 5395	470pF 20% Ceram DI
	C255	73. 5171	2. 2uF 20% Tantal
	C256	74. 5398	1. 5nF 20% Ceram DI
20 W	C257	75. 5053	33 pF 5% Mica
	C258	74. 5398	1. 5 nF 20% Ceramic 2DI
	C259	74. 5364	2. 7 pF 0. 25 pF Ceram DI
	C301	74. 5396	680pF 20% Ceram DI
	C302	76. 5135	10nF 10% Polyester FL
	C303	74. 5386	180pF 5% Ceram DI
	C304	74. 5396	680pF 20% Ceram DI
	C305	74. 5405	68pF 5% Ceram DI
	C306	74. 5403	18pF 5% Ceram DI
	C307	74. 5370	8. 2pF 5% Ceram DI

RF UNIT RF5660a

X402. 850

TYPE	NO	CODE	DATA
	C308	74. 5386	180pF 5% Ceram DI
	C309	79. 5007	0. 82pF 5% Phenolic TB
	C310	74. 5374	18 pF 5% Ceram DI
	C311	74. 5375	22pF 5% Ceram DI
	C312	73. 5171	2. 2uF 20% Tantal
	C313	74. 5395	470pF 20% Ceram DI
	C314	78. 5068	1. 8/10pF Teflon trimmer
	C315	74. 5395	470pF 20% Ceram DI
	C316	74. 5395	470pF 20% Ceram DI
	C317	74. 5375	22pF 5% Ceram DI
	C318	74. 5379	47pF 5% Ceram DI
	C319	74. 5391	100pF 20% Ceramic DI
	C401	74. 5395	470pF 20% Ceram DI
	C402	74. 5395	470pF 20% Ceram DI
	C403	74. 5395	470pF 20% Ceram DI
	C404	74. 5395	470pF 20% Ceram DI
	C405	74. 5368	5. 6pF 0. 25pF Ceram DI
	C406	74. 5395	470pF 20% Ceram DI
	C408	74. 5365	3. 3pF 0. 25pF Ceram DI
	C409	75. 5135	10nF 10% Polyester FL
	C410	74. 5371	10pF 5% Ceram DI
	C411	76. 5135	10nF 10% Polyester FL
	C412	74. 5414	120pF 5% Ceram DI
	C413	74. 5382	82pF 5% Ceram DI
	C414	74. 5374	18pF 5% Ceram DI
	C501	74. 5375	22pF 5% Ceram DI
	C502	74. 5395	470pF 20% Ceram DI
	C503	76. 5135	10nF 10% Polyester FL
	C504	76. 5135	10nF 10% Polyester FL
	C505	76. 5135	10nF 10% Polyester FL
	C506	74. 5379	47pF 5% Ceram DI
	C507	74. 5383	100pF 5% Ceram DI
	C508	74. 5387	220pF 5% Ceram DI
	C509	76. 5133	4. 7nF 10% Polyester FL
	C510	73. 5170	1. 0uF 20% Tantal
	C511	73. 5168	0. 22uF 20% Tantal
	C512	73. 5170	1. 0uF 20% Tantal
	C513	73. 5170	1. 0uF 20% Tantal
	C514	73. 5170	1. 0uF 20% Tantal
	C515	73. 5168	0. 22uF 20% Tantal
	C516	73. 5168	0. 22uF 20% Tantal
	C517	74. 5393	220pF 20% Ceram DI
	C518	74. 5393	220pF 20% Ceram DI
	C519	74. 5397	1nF 20% Ceram DI
	C520	73. 5170	1. 0uF 20% Tantal
	C521	73. 5166	470uF -10 +100% Elco
	C522	76. 5132	3. 3nF 10% Polyester FL
	C601	76. 5133	4. 7nF 10% Polyester FL

TYPE	NO	CODE	DATA
	C602	76. 5134	6. 8nF 10% Polyester FL
	C603	76. 5139	47nF 10% Polyester FL
	C604	73. 5172	4. 7uF 20% Tantal
	C605	73. 5164	47uF -10 +100% Elco
	C606	73. 5170	1. 0uF 20% Tantal
	C607	73. 5169	0. 47uF 20% Tantal
	C608	76. 5144	0. 1uF 10% Polyester FL
	C609	73. 5172	4. 7uF 20% Tantal
	C610	73. 5175	47uF 20% Tantal
	C611	76. 5144	0. 1uF 10% Polyester FL
	C612	73. 5168	0. 22uF 20% Tantal
	C613	76. 5148	0. 47uF 10% Polyester FL
	C614	73. 5166	470uF -10 +100% Elco
	C615	76. 5143	68nF 10% Polyester FL
	C616	76. 5143	68nF 10% Polyester FL
	C617	73. 5164	47uF -10 +100% Elco
	C618	73. 5165	220uF -10 +100% Elco
	C620	74. 5395	470pF 20% Ceram DI
	C621	74. 5395	470pF 20% Ceram DI
	D101	99. 5374	1N458A Diode
	D102	99. 5374	1N458A Diode
	D151	99. 5341	Cap. diode
	D152	99. 5237	1N4148 Diode
	D201	99. 5237	1N4148 Diode
	D301	99. 5341	Cap. diode
	D501	99. 5237	1N4148 Diode
	D502	99. 5237	1N4148 Diode
	D601	99. 5237	1N4148 Diode
	D602	99. 5237	1N4148 Diode
	D603	99. 5237	1N4148 Diode
	D604	99. 5237	1N4148 Diode
	D605	99. 5237	1N4148 Diode
	D606	99. 5303	1. 6V LED/RD
	D607	99. 5237	1N4148 Diode
	J151	41. 5229	Socket
	J301	41. 5229	Socket
	J601	41. 5165	Connector UHF
	K601	58. 5085	2T-2T Relay
	L151	61. 5034	RF coil
	L152	61. 5030	1. 5uH 10% HF choke
	L153	61. 5033	RF coil
	L154	61. 5031	10uH 10% HF choke

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X402. 850

TYPE	NQ	CODE	DATA
	L155	61.5030	1.5uH 10% HF choke
	L201	61.5029	1.0uH 10% HF choke
	L202	61.5028	0.1uH 10% HF choke
	L203	61.5035	RF coil
	L204	61.5035	RF coil
	L205	61.5029	1.0uH 10% HF choke
	L206	62.1001	RF coil
	L207	61.1383	RF choke
	L208	62.0999	RF coil
	L209	62.0998	RF coil
	L210	62.1002	RF coil
	L211	62.0999	RF coil
	L212	62.0999	RF coil
	L213	61.1383	RF choke
	L217	61.1383	RF choke
	L218	62.1034	RF coil
	L222	61.1383	RF choke
20W	L223	62.1000	RF coil
20W	L226	61.5044	6.3uH 10% HF choke
20W	L228	62.1000	RF coil
5W	L228	62.1000	RF coil
	L231	62.0997	Strap
	L232	62.0996	RF coil, L233 incl.
5W	L234	62.1003	Strap inductance
	L301	61.5034	RF coil
	L302	61.5015	3.3uH 10% HF choke
	L303	61.5046	RF coil
	L305	61.5045	RF coil
	L307	61.5061	Helical coil
	L308	61.5061	Helical coil
	L401	61.5061	Helical coil
	L402	61.5061	Helical coil
	L403	61.1411	RF choke
	L405	61.5061	Helical coil
	L406	61.5061	Helical coil
	L407	61.5060	Helical Coil
	L410	61.5050	RF coil
	L501	61.5027	21.4MHz IF transformer
	L502	61.5027	21.4MHz IF transformer
	L503	61.5025	455kHz IF transformer
	L504	61.5025	455kHz IF transformer
	L601	61.5023	75mH Choke
	P101	41.0238	Modified connector
	P201	41.5545	Fem. connector
	P901	41.0238	Modified connector
	P903	41.0230	Fem. connector
	Q151	99.5347	PN2369 Transistor
	Q201	99.5348	RF transistor

TYPE	NQ	CODE	DATA
	Q202	99.5355	RF transistor
	Q203	99.5348	RF transistor
	Q204	99.5354	RF transistor
	Q205	99.5357	RF power transistor
20 W	Q206	99.5375	RF power transistor
	Q207	99.5345	BD201 Transistor
	Q208	99.5251	BC307 transistor
	Q209	99.5121	BC237 transistor
	Q210	99.5121	BC237 transistor
	Q301	99.5347	PN2369 Transistor
	Q302	99.5347	PN2369 Transistor
	Q303	99.5356	BFW92 Transistor
	Q401	99.5290	BFR34 transistor
	Q402	99.5245	2N5245 J-FET
	Q501	99.5291	3N205 MOS-FET
	Q601	99.5143	BC238 transistor
	Q602	99.5201	BC239 transistor
	Q603	99.5115	BC309 transistor
	Q604	99.5115	BC309 transistor
	Q605	99.5115	BC309 transistor
	R102	80.5265	22Kohm 5% Carbon film
	R103	80.5243	330ohm 5% Carbon film
	R104	89.5095	51Kohm 5% Carbon film
	R105	89.5083	10.5Kohm 1% Metal film
	R106	89.5085	12.7Kohm 1% Metal film
	R107	89.5083	10.5Kohm 1% Metal film
	R108	89.5082	5.11Kohm 1% Metal film
	R109	89.5091	1.3Kohm 5% Carbon film
	R109	80.5252	1.8Kohm 5% Carbon film
	R110	89.5082	5.11Kohm 1% Metal film
	R112	89.5086	20Kohm 1% Metal film
	R113	89.5084	12.4Kohm 1% Metal film
	R114	80.5267	33 Kohm 5% Carbon film
	R115	80.5253	2.2 Kohm 5% Carbon film
	R116	86.5078	5Kohm 10% Carbon pot.
	R117	80.5254	2.7Kohm 5% Carbon film
	R151	80.5259	6.8Kohm 5% Carbon film
	R152	80.5259	6.8Kohm 5% Carbon film
	R153	89.5088	3.3Kohm 10% NTC
	R154	80.5269	47Kohm 5% Carbon film
	R155	80.5242	270ohm 5% Carbon film
	R156	80.5260	8.2Kohm 5% Carbon film

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TYPE	Nº	CODE	DATA
	R157	80. 5259	6. 8 Kohm 5% Carbon film
	R158	80. 5242	270ohm 5% Carbon film
	R159	80. 5237	100ohm 5% Carbon film
	R160	80. 5263	15Kohm 5% Carbon film
	R161	80. 5257	4. 7Kohm 5% Carbon film
	R201	89. 5098	2. 43Kohm 1% Metal film
	R202	89. 5099	232ohm 1% Metal film
	R203	80. 5229	22ohm 5% Carbon film
	R204	80. 5233	47ohm 5% Carbon film
	R205	80. 5240	180ohm 5% Carbon film
	R206	80. 5227	15ohm 5% Carbon film
	R207	80. 5229	22ohm 5% Carbon film
	R208	89. 5098	2. 43Kohm 1% Metal film
	R209	89. 5097	392ohm 1% Metal film
	R210	80. 5227	15ohm 5% Carbon film
	R211	80. 5229	22ohm 5% Carbon film
	R212	80. 5227	15ohm 5% Carbon film
	R213	89. 5100	27ohm 5% Carbon comp.
	R215	86. 5078	5Kohm 10% Carbon pot.
	R216	80. 5249	1Kohm 5% Carbon film
	R217	80. 5253	2. 2Kohm 5% Carbon film
	R218	80. 5249	1Kohm 5% Carbon film
	R219	80. 5259	6. 8Kohm 5% Carbon film
	R221	80. 5252	1. 8Kohm 5% Carbon film
	R222	80. 5241	220ohm 5% Carbon film
	R224	80. 5246	560ohm 5% Carbon film
	R225	80. 5245	470ohm 5% Carbon film
	R301	80. 5259	6. 8Kohm 5% Carbon film
	R302	80. 5255	3. 3Kohm 5% Carbon film
	R303	80. 5242	270ohm 5% Carbon film
	R304	80. 5269	47Kohm 5% Carbon film
	R305	80. 5247	680ohm 5% Carbon film
	R306	80. 5260	8. 2Kohm 5% Carbon film
	R307	80. 5259	6. 8 Kohm 5% Carbon film
	R308	80. 5242	270ohm 5% Carbon film
	R309	80. 5229	22ohm 5% Carbon film
	R310	80. 5225	10ohm 5% Carbon film
	R312	80. 5249	1Kohm 5% Carbon film
	R313	80. 5234	56ohm 5% Carbon film
	R314	80. 5225	10ohm 5% Carbon film
	R315	80. 5225	10ohm 5% Carbon film
	R401	80. 5257	4. 7Kohm 5% Carbon film
	R402	80. 5249	1Kohm 5% Carbon film
	R403	80. 5234	56ohm 5% Carbon film
	R404	80. 5234	56ohm 5% Carbon film
	R405	80. 5252	1. 8Kohm 5% Carbon film
	R406	80. 5234	56ohm 5% Carbon film

TYPE	Nº	CODE	DATA
	R407	80. 5237	100ohm 5% Carbon film
	R408	80. 5232	39ohm 5% Carbon film
	R501	80. 5253	2. 2Kohm 5% Carbon film
	R502	80. 5266	27Kohm 5% Carbon film
	R503	80. 5266	27Kohm 5% Carbon film
	R504	80. 5243	330ohm 5% Carbon film
	R505	80. 5242	270ohm 5% Carbon film
	R506	80. 5260	8. 2Kohm 5% Carbon film
	R507	80. 5259	6. 8Kohm 5% Carbon film
	R508	80. 5253	2. 2Kohm 5% Carbon film
	R509	80. 5253	2. 2Kohm 5% Carbon film
	R510	80. 5262	12Kohm 5% Carbon film
	R511	80. 5247	680ohm 5% Carbon film
	R512	80. 5243	330ohm 5% Carbon film
	R513	80. 5243	330ohm 5% Carbon film
	R514	80. 5252	1. 8Kohm 5% Carbon film
	R515	80. 5262	12Kohm 5% Carbon film
	R516	80. 5247	680ohm 5% Carbon film
	R517	80. 5259	6. 8Kohm 5% Carbon film
	R518	80. 5260	8. 2Kohm 5% Carbon film
	R519	80. 5252	1. 8Kohm 5% Carbon film
	R520	80. 5261	10Kohm 5% Carbon film
	R521	86. 5060	25Kohm 20% Carbon pot.
	R522	80. 5261	10Kohm 5% Carbon film
	R523	80. 5255	3. 3Kohm 5% Carbon film
	R524	80. 5268	39Kohm 5% Carbon film
	R525	80. 5268	39Kohm 5% Carbon film
	R526	80. 5221	4. 7ohm 5% Carbon film
	R527	80. 5237	100ohm 5% Carbon film
	R601	80. 5269	47Kohm 5% Carbon film
	R602	80. 5265	22Kohm 5% Carbon film
	R603	80. 5243	330ohm 5% Carbon film
	R604	80. 5264	18Kohm 5% Carbon film
	R605	80. 5261	10Kohm 5% Carbon film
	R606	80. 5278	270Kohm 5% Carbon film
	R607	86. 5080	10Kohm 20% Carbon pot.
	R608	80. 5259	6. 8Kohm 5% Carbon film
	R609	89. 5053	470ohm 20% NTC
	R610	80. 5260	8. 2Kohm 5% Carbon film
	R611	80. 5238	120ohm 5% Carbon film
	R612	80. 5245	470ohm 5% Carbon film

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TYPE	Nº	CODE	DATA
	C102	28.0123	Tuning slug
	C103	73.5172	4.7uF 20% Tantal
	C104	73.5172	4.7uF 20% Tantal
	C106	76.5142	47nF 5% Polyester FL
	C107	73.5170	1.0uF 20% Tantal
	C108	73.5172	4.7uF 20% Tantal
	C109	76.5140	6.8nF 5% Polyester FL
	C110	76.5135	10 nF 5% Polyester FL
	C111	76.5156	1nF 5% Polyester FL
	C112	4.7uF 20% Tantal	4.7uF 20% Tantal
	C114	76.5172	68nF 5% Polyester FL
	C115	74.5371	10pF 20% Ceram DI
	C117	73.5173	150 pF 20% Ceramic DI2
	C121	76.5135	10uF 20% Tantal
	C122	76.5135	10nF 10% Polyester FL
	C123	74.5386	180pF 5% Ceram DI
	C124	74.5396	680pF 20% Ceram DI
	C125	74.5405	68pF 5% Ceram DI
	C126	74.5403	18pF 5% Ceram DI
	C127	74.5374	18pF 5% Ceram DI
	C128	74.5377	33pF 5% Ceram DI
	C129	73.5171	2.2uF 20% Tantal
	C130	74.5395	470pF 20% Ceram DI
	C131	74.5372	12pF 5% Ceram DI
	C132	74.5372	12pF 5% Ceram DI
	C133	76.5135	10nF 10% Polyester FL
	C134	74.5378	39pF 5% Ceram DI
	C135	74.5398	1.5nF 20% Ceram DI
	C136	74.5373	15pF 5% Ceram DI
	C137	74.5376	27pF 5% Ceram DI
	C138	79.5005	0.56pF 5% Phenolic TB
	C139	74.5376	27pF 5% Ceram DI
	C140	74.5372	12pF 5% Ceram DI
	C141	74.5371	10pF 5% Ceram DI
	C142	74.5371	10pF 5% Ceram DI
	C143	74.5377	33pF 5% Ceram DI
	C144	74.5413	2.2pF 0.1pF DI
	C145	78.5065	2/10pF Air trimmer
	C146	79.5002	0.27pF 5% Phenolic TB
	C147	78.5065	2/10pF Air trimmer
	C148	74.5368	5.6pF 0.25pF Ceram DI
	C149	74.5377	33pF 5% Ceram DI
	C150	74.5398	1.5nF 20% Ceram DI

TYPE	Nº	CODE	DATA
	C219	74.5413	2.2pF 0.1pF DI
	C220	74.5398	1.5nF 20% Ceram DI
	C221	78.5065	2/10pF Air trimmer
	C222	79.5004	0.47pF 5% Phenolic TB
	C223	78.5065	2/10pF Air trimmer
	C224	74.5413	2.2pF 0.1pF DI
	C225	74.5364	2.7pF 0.25pF Ceram DI
	C226	74.5395	470pF 20% Ceram DI
	C227	74.5398	1.5 nF 20% Ceramic 2DI
	C230	74.5377	33pF 5% Ceram DI
	C231	74.5368	5.6pF 0.25pF Ceram DI
	C232	74.5368	5.6pF 0.25pF Ceram DI
	C233	76.5139	47nF 10% Polyester FL
	C234	74.5372	12pF 5% Ceram DI
	C235	74.5414	150pF 20% Ceram DI
	C236	75.5038	45pF 5% Mica
	C237	75.5038	45pF 5% Mica
	C238	74.5376	27pF 5% Ceram DI
	C239	74.5396	680pF 20% Ceram DI
	C240	73.5171	2.2uF 20% Tantal
	C241	75.5025	30 pF 5% Teflon
	C242	75.5054	39 pF 5% Mica
	C243	75.5038	45 pF 5% Mica
	C244	74.5376	27 pF 5% Ceram DI
	C245	74.5396	680 pF 20% Ceram DI
	C246	A700003PS	2.2 uF 20% TA SOL
	C247	75.5053	33 pF 5% Mica
	C248	75.5051	13 pF 5% Mica
	C249	75.5044	47 pF 2% Teflon
	C250	75.5034	12pF 0.5pF Teflon
	C251	75.5036	20pF 0.5pF Teflon
	C252	75.5035	11pF 0.5pF Teflon
	C253	74.5361	1.5 pF 0.25 pF Ceram DI
	C254	74.5395	470pF 20% Ceram DI
	C255	73.5171	2.2uF 20% Tantal
	C256	74.5398	1.5nF 20% Ceram DI
	C257	75.5053	33 pF 5% Mica
	C258	74.5398	1.5 nF 20% Ceramic 2DI
	C259	74.5364	2.7 pF 0.25 pF Ceram DI
	C301	74.5396	680pF 20% Ceram DI
	C302	76.5135	10nF 10% Polyester FL
	C303	74.5386	180pF 5% Ceram DI

TYPE	Nº	CODE	DATA
	C102	28.0123	Tuning slug
	C103	73.5172	4.7uF 20% Tantal
	C104	73.5172	4.7uF 20% Tantal
	C106	76.5142	47nF 5% Polyester FL
	C107	73.5170	1.0uF 20% Tantal
	C108	73.5172	4.7uF 20% Tantal
	C109	76.5140	6.8nF 5% Polyester FL
	C110	76.5135	10 nF 5% Polyester FL
	C111	76.5156	1nF 5% Polyester FL
	C112	73.5172	4.7uF 20% Tantal
	C114	76.5151	68nF 5% Polyester FL
	C115	74.5371	10pF 20% Ceram DI
	C116	74.5392	150 pF 20% Ceramic DI2
	C117	73.5173	10uF 20% Tantal
	C118	76.5135	10nF 10% Polyester FL
	C119	74.5386	180pF 5% Ceram DI
	C120	74.5396	680pF 20% Ceram DI
	C121	74.5405	68pF 5% Ceram DI
	C122	74.5403	18pF 5% Ceram DI
	C123	74.5374	18pF 5% Ceram DI
	C124	74.5377	33pF 5% Ceram DI
	C125	73.5171	2.2uF 20% Tantal
	C126	74.5395	470pF 20% Ceram DI
	C127	74.5372	12pF 5% Ceram DI
	C128	74.5372	12pF 5% Ceram DI
	C129	76.5135	10nF 10% Polyester FL
	C130	74.5378	39pF 5% Ceram DI
	C131	74.5398	1.5nF 20% Ceram DI
	C132	74.5373	15pF 5% Ceram DI
	C133	74.5376	27pF 5% Ceram DI
	C134	79.5005	0.56pF 5% Phenolic TB
	C135	74.5376	27pF 5% Ceram DI
	C136	74.5372	12pF 5% Ceram DI
	C137	74.5371	10pF 5% Ceram DI
	C138	74.5371	10pF 5% Ceram DI
	C139	74.5377	33pF 5% Ceram DI
	C140	74.5413	2.2pF 0.1pF DI
	C141	78.5065	2/10pF Air trimmer
	C142	79.5002	0.27pF 5% Phenolic TB
	C143	78.5065	2/10pF Air trimmer
	C144	74.5368	5.6pF 0.25pF Ceram DI
	C145	74.5377	33pF 5% Ceram DI
	C146	74.5398	1.5nF 20% Ceram DI

TYPE	Nº	CODE	DATA
	C219	74.5413	2.2pF 0.1pF DI
	C220	74.5398	1.5nF 20% Ceram DI
	C221	78.5065	2/10pF Air trimmer
	C222	79.5004	0.47pF 5% Phenolic TB
	C223	78.5065	2/10pF Air trimmer
	C224	74.5413	2.2pF 0.1pF DI
	C225	74.5364	2.7pF 0.25pF Ceram DI
	C226	74.5395	470pF 20% Ceram DI
	C227	74.5398	1.5 nF 20% Ceramic 2DI
	C230	74.5377	33pF 5% Ceram DI
	C231	74.5368	5.6pF 0.25pF Ceram DI
	C232	74.5368	5.6pF 0.25pF Ceram DI
	C233	76.5139	47nF 10% Polyester FL
	C234	74.5372	12pF 5% Ceram DI
	C235	74.5414	150pF 20% Ceram DI
	C236	75.5038	45pF 5% Mica
	C237	75.5038	45pF 5% Mica
	C238	74.5376	27pF 5% Ceram DI
	C239	74.5396	680pF 20% Ceram DI
	C240	73.5171	2.2uF 20% Tantal
	C241	75.5025	30 pF 5% Teflon
	C242	75.5054	39 pF 5% Mica
	C243	75.5038	45 pF 5% Mica
	C244	74.5376	27 pF 5% Ceram DI
	C245	74.5396	680 pF 20% Ceram DI
	C246	A700003PS	2.2 uF 20% TA SOL
	C247	75.5053	33 pF 5% Mica
	C248	75.5051	13 pF 5% Mica
	C249	75.5044	47 pF 2% Teflon
	C250	75.5034	12pF 0.5pF Teflon
	C251	75.5036	20pF 0.5pF Teflon
	C252	75.5035	11pF 0.5pF Teflon
	C253	74.5361	1.5 pF 0.25 pF Ceram DI
	C254	74.5395	470pF 20% Ceram DI
	C255	73.5171	2.2uF 20% Tantal
	C256	74.5398	1.5nF 20% Ceram DI
	C257	75.5053	33 pF 5% Mica
	C258	74.5398	1.5 nF 20% Ceramic 2DI
	C259	74.5364	2.7 pF 0.25 pF Ceram DI
	C301	74.5396	680pF 20% Ceram DI
	C302	76.5135	10nF 10% Polyester FL
	C303	74.5386	180pF 5% Ceram DI

TYPE	NO	CODE	DATA
	D604	99.5237	1N4148 Diode
	D605	99.5237	1N4148 Diode
	D606	99.5303	1.6V LED/RD
	D607	99.5237	1N4148 Diode
	J151	41.5529	Socket
	J301	41.5529	Socket
	J601	41.5165	Connector UHF
	K601	58.5085	21-21 Relay
	L151	61.5034	RF coil, tuneable
	L152	61.5030	1.5uH 10% HF choke
	L153	61.5033	RF coil, tuneable
	L154	61.5031	10uH 10% HF choke
	L155	A700024P10	0.56uH 10% HF choke
	L202	A700024P1	0.1 uH 10% HF choke
	L203	61.5035	RF coil, tuneable
	L204	61.5035	RF coil, tuneable
	L205	A700024P1	0.1 uH 10% HF choke
	L206	62.1001	RF coil
	L207	A700024P5	0.22 uH 10% HF choke
	L208	62.0999-01	RF coil
	L209	62.0998-01	RF coil
	L210	62.1002	RF coil
	L211	62.0999-01	RF coil
	L212	62.0999-01	RF coil
	L213	A700024P5	0.22 uH 10% HF-choke
	L217	61.1383	RF choke
	L218	62.1034	RF coil
	L222	61.1383	RF choke
	L223	62.1000	RF coil
	L226	61.5044	6.3 uH 10% HF choke
	L228	62.1000	RF coil
	L231	62.1038	Strap
	L232	D800554P2	COIL AIR, L233 incl.
	L301	61.5034	RF coil, tuneable
	L302	61.5015	3.3uH 10% HF choke
	L303	61.5046	RF coil, tuneable
	L305	61.5045	RF coil, tuneable
	L307	J706154P2	Helical coil
	L308	J706154P2	Helical coil
	L401	J706154P2	Helical coil
	L402	J706154P2	Helical coil
	L403	61.1411	RF choke

TYPE	NO	CODE	DATA
	L405	J706154P2	Helical coil
	L406	J706154P2	Helical coil
	L407	J706084P1	Helical coil
	L410	61.5050	RF coil, tuneable
	L501	61.5027	21.4MHz IF transformer
	L502	61.5025	21.4MHz IF transformer
	L503	61.5025	455kHz IF transformer
	L504	61.5025	455kHz IF transformer
	L601	61.5023	75mH Choke
	P101	41.0238	Modified connector
	P201	41.5545	Fem. connector
	P901	41.0238	Modified connector
	P903	41.0230	Fem. connector
	Q151	99.5347	PN2369 Transistor
	Q201	99.5348	RF transistor
	Q202	99.5355	RF transistor
	Q203	99.5348	RF transistor
	Q204	99.5354	RF transistor
	Q205	99.5357	RF power transistor
	Q206	J708167P1	RF Power transistor
	Q207	99.5345	BD201 Transistor
	Q208	99.5251	BC307 transistor
	Q209	99.5121	BC237 transistor
	Q210	99.5121	BC237 transistor
	Q301	99.5347	PN2369 Transistor
	Q302	99.5347	PN2369 Transistor
	Q303	99.5356	BFV92 Transistor
	Q401	J706011P2	BFR91A Transistor
	Q402	99.5245	2N5245 J-FET
	Q501	99.5291	3N205 MOS-FET
	Q601	99.5143	BC238 transistor
	Q602	99.5201	BC239 transistor
	Q603	99.5115	BC309 transistor
	Q604	99.5115	BC309 transistor
	Q605	99.5115	BC309 transistor
	R102	80.5265	22Kohm 5% Carbon film
	R103	80.5243	330ohm 5% Carbon film
	R104	89.5095	51Kohm 5% Carbon film
	R105	89.5083	10.5Kohm 1% Metal film
	R106	89.5085	12.7Kohm 1% Metal film
	R107	89.5083	10.5Kohm 1% Metal film
	R108	89.5082	5.11Kohm 1% Metal film

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Storno

TYPE	Nº	CODE	DATA
RF5664	R109	89.5091	1.8W
	R109	80.5252	1/8 W
	R110	89.5082	1/4W
	R112	89.5086	1/4W
	R113	89.5084	1/4W
	R114	80.5267	1/8W
	R115	80.5253	1/8W
	R116	86.5078	0.5W
	R117	80.5249	1/8 W
	R118	80.5237	1/8 W
	R151	80.5259	1/8W
	R152	80.5259	1/8W
	R153	89.5088	0.5W
	R154	80.5269	1/8W
	R155	80.5242	1/8W
	R156	A700019P46	1/8W
	R157	80.5259	1/8W
	R158	80.5242	1/8W
	R160	80.5263	1/8W
	R161	80.5257	1/8W
	R201	A700019P39	1/8 W
	R202	80.5241	1/8 W
	R204	80.5233	1/8W
	R205	80.5250	1/8 W
	R207	80.5229	1/8W
	R208	89.5098	1/4W
	R209	89.5097	1/4W
	R210	80.5227	1/8W
	R211	80.5229	1/8W
	R212	80.5227	1/8W
	R213	89.5100	1/4W
	R215	86.5078	0.5 W
	R216	80.5249	1/8W
R217	80.5253	1/8W	
R218	80.5249	1/8W	
R219	80.5259	1/8W	
R221	80.5252	1/8W	
R222	80.5241	1/8W	
R224	80.5246	1/8W	
R225	80.5245	1/8W	
R301	80.5259	1/8W	
R302	80.5255	1/8W	

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Storno

TYPE	Nº	CODE	DATA
	R303	80.5242	270ohm 5% Carbon film
	R304	80.5269	47Kohm 5% Carbon film
	R305	80.5247	680ohm 5% Carbon film
	R306	A700019P46	5.6Kohm 5% Carbon film
	R307	80.5259	6.8 Kohm 5% Carbon film
	R308	80.5242	270ohm 5% Carbon film
	R309	80.5229	22ohm 5% Carbon film
	R310	80.5225	10ohm 5% Carbon film
	R312	80.5249	1Kohm 5% Carbon film
	R313	80.5234	56ohm 5% Carbon film
	R314	80.5225	10ohm 5% Carbon film
	R315	80.5225	10ohm 5% Carbon film
	R401	80.5257	4.7Kohm 5% Carbon film
	R402	80.5249	1Kohm 5% Carbon film
	R403	80.5234	56ohm 5% Carbon film
	R404	80.5234	56ohm 5% Carbon film
	R405	80.5252	1.8Kohm 5% Carbon film
	R406	80.5234	56ohm 5% Carbon film
	R407	80.5237	100ohm 5% Carbon film
	R408	80.5232	39ohm 5% Carbon film
	R501	80.5253	2.2Kohm 5% Carbon film
	R502	80.5266	27Kohm 5% Carbon film
	R503	80.5266	27Kohm 5% Carbon film
	R504	80.5243	330ohm 5% Carbon film
	R505	80.5242	270ohm 5% Carbon film
	R506	80.5260	8.2Kohm 5% Carbon film
	R507	80.5259	6.8Kohm 5% Carbon film
	R508	80.5253	2.2Kohm 5% Carbon film
	R509	80.5253	2.2Kohm 5% Carbon film
	R510	80.5262	12Kohm 5% Carbon film
	R511	80.5247	680ohm 5% Carbon film
	R512	80.5243	330ohm 5% Carbon film
	R513	80.5243	330ohm 5% Carbon film
	R514	80.5252	1.8Kohm 5% Carbon film
	R515	80.5262	12Kohm 5% Carbon film
	R516	80.5247	680ohm 5% Carbon film
	R517	80.5259	6.8Kohm 5% Carbon film
	R518	80.5260	8.2Kohm 5% Carbon film
	R519	80.5252	1.8Kohm 5% Carbon film
	R520	80.5261	10Kohm 5% Carbon film
	R521	J708394P9	22Kohm 20% VAR CERAM
	R522	80.5261	10Kohm 5% Carbon film

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Storno

TYPE	NO	CODE	DATA
	R523	80.5255	3.3Kohm 5% Carbon film 1/8W
	R524	80.5268	39Kohm 5% Carbon film 1/8W
	R525	80.5268	39Kohm 5% Carbon film 1/8W
	R526	80.5221	4.7ohm 5% Carbon film 1/8W
	R527	80.5237	100ohm 5% Carbon film 1/8W
	R601	80.5269	47Kohm 5% Carbon film 1/8W
	R602	80.5265	22Kohm 5% Carbon film 1/8W
	R603	80.5243	330ohm 5% Carbon film 1/8W
	R604	80.5264	18Kohm 5% Carbon film 1/8W
	R605	80.5261	10Kohm 5% Carbon film 1/8W
	R606	80.5278	270Kohm 5% Carbon film 1/8W
	R607	J708394P8	10Kohm 20% VAR CERM 0.1W
	R608	80.5259	6.8Kohm 5% Carbon film 1/8W
	R609	89.5053	470ohm 20% NTC 0.5W
	R610	80.5260	8.2Kohm 5% Carbon film 1/8W
	R611	80.5238	120ohm 5% Carbon film 1/8W
	R612	80.5245	470ohm 5% Carbon film 1/8W
	R613	80.5248	820ohm 5% Carbon film 1/8W
	R614	80.5256	3.9Kohm 5% Carbon film 1/8W
	R615	80.5269	47Kohm 5% Carbon film 1/8W
	R616	80.5261	10Kohm 5% Carbon film 1/8W
	R617	80.5280	390Kohm 5% Carbon film 1/8W
	R618	80.5262	12Kohm 5% Carbon film 1/8W
	R619	80.5266	27Kohm 5% Carbon film 1/8W
	R620	80.5266	27Kohm 5% Carbon film 1/8W
	R621	80.5252	1.8Kohm 5% Carbon film 1/8W
	R622	80.5243	330ohm 5% Carbon film 1/8W
	R623	80.5259	6.8Kohm 5% Carbon film 1/8W
	R624	80.5261	10Kohm 5% Carbon film 1/8W
	R625	89.5093	3 Kohm 5% Carbon film 1/8W
	R626	80.5249	1Kohm 5% Carbon film 1/8W
	R627	80.5240	180 ohm 5% Carbon film 1/8W
	R628	80.5239	150 ohm 5% Carbon film 1/8W
	R629	80.5260	8.2Kohm 5% Carbon film 1/8W
	R630	86.5077	47Kohm 20% Carbon pot., log. 0.15W
	R631	80.5229	22ohm 5% Carbon film 1/8W
	R632	80.5213	1ohm 5% Carbon film 1/8W
	R633	80.5238	120ohm 5% Carbon film 1/8W
	R634	80.5213	1ohm 5% Carbon film 1/8W
	R635	80.5234	56ohm 5% Carbon film 1/8W
	R636	80.52xx	ADJ 5% Carbon film, see diagr. 1/8W
	R637	80.5247	680 ohm 5% Carbon film 1/8W

Storno

TYPE	NO	CODE	DATA
	R638	80.5413	1ohm 5% Carbon film 1/4W
	R639	80.5237	100ohm 5% Carbon film 1/8W
	S601	B800563P1	Switch
	S602	B800563P1	Switch
	U101	14.5141	4558 Dual op-amp
	U501	14.5128	CA3054 IF amplifier
	U502	14.5129	TBA750 IF amplifier/detector
	U601	14.5130	TDA2002 AF power amplifier
	U602	14.0133	Voltage reg., grouped 8V 0.5A
	W201	62.1004	Jumper
	W202	62.1004	Jumper
	W203	62.1037	Coil, jumper
	W204	62.1004	Jumper
	W205	62.1004	Jumper
	W401	62.1004	Jumper
	W601	62.1004	Jumper
	Y501	98.5032	Crystal 98-58
	Z201	61.1384	Damping choke
	Z202	61.1384	Damping choke
	Z203	J709081G3	Filter
5662	Z501	69.5040	21.4MHz Crystal filter 25kHz
5663	Z501	69.5041	21.4MHz Crystal filter 20kHz
5664	Z501	J706046P1	21.4 MHz Crystal filter 12.5 kHz
5662/63	Z502	69.5045	455kHz Ceramic filter 20/25kHz
5664	Z502	69.5046	455 kHz Ceramic filter 12.5 kHz