MAINTENANCE MANUAL
CQM5000
VOLUME I

SEE:

VOLUME II AND VOLUME III

OPERATING INSTRUCTIONS

STORNOPHONE 5000

INSTRODUCTION

The CQM5000 is available with local control only and four different control heads cover the various versions.
No unnecessary controls are accessible at the front, e.g. radios without tone equipment don't have any loudspeaker IN/OUT nor tone transmitter key on the control head.
The transmitter key button is on the microphone MC5001 or mounted separately, SU701, SU702.
Control heads for the four versions are shown below:

Stand-by

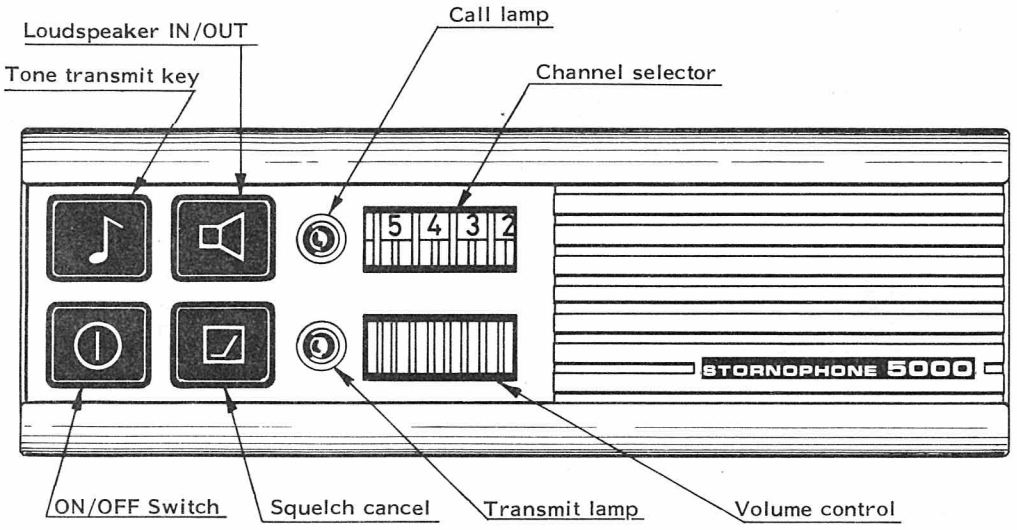
The radio is turned on by depressing the ON/OFF switch.
The thumb-wheel channel selector is accessible on the multichannel version and has the channel numbers on the rim. A lamp built into the channel selector illuminates the channel number from the inside. Single channel units have no 'power on' indicator. The radio is now ready to receive or transmit.

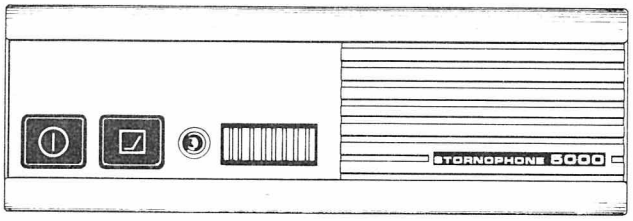
RECEIVE WITHOUT TONE EQUIPMENT

With the radio in standby the volume control is adjusted to an appropriate level.
If no signals are received the volume may be set by depressing the squelch button and monitor the noise from the loudspeaker. Received calls will now be heard in the loudspeaker.
By pressing the squelch cancel button, the intelligibility may be improved, even if the signal is very noisy. The squelch cancel button is self locking.

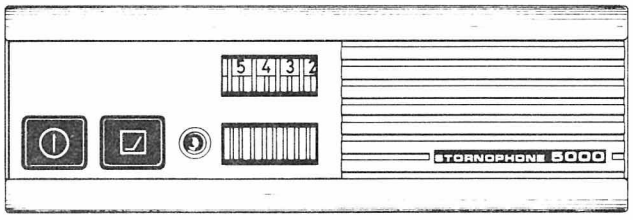
RECEIVE WITH TONE EQUIPMENT

In radios with tone equipment only calls where the number complies with the coding of the tone equipment will be heard in the loudspeaker. Reception of a call that matches the call number will cause the tone equipment to cancel the loudspeaker blocking so that the call can be heard. Simultaneously, the green call indicator will start flashing until the conversation is terminated by pressing the loudspeaker IN/OUT button.
The loudspeaker will now again be blocked, and the call indicator will stop flashing.





Version
One channel without tone equipment



Version
Six channel without tone equipment

GROUP CALL - ALL CALL

The tone unit TQ5001 function can be expanded with a group call unit SU5001 or All Call unit SU5002.

When receiving a group call or an all call, the green call indicator will only flash during the message. The call indicator will stop flashing when the received carrier disappears, or when the loudspeaker IN/OUT button is depressed.

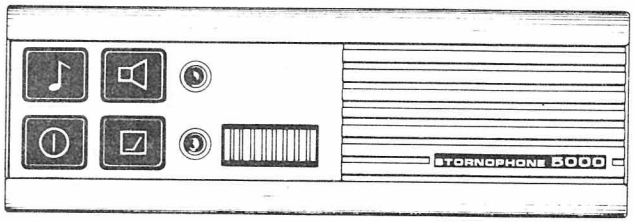
TRANSMIT WITHOUT TONE EQUIPMENT

Before keying the transmitter the channel must be clear. In radios without tone equipment the operator can always hear when conversation takes place on the channel.
When the channel is clear, the transmitter is keyed by using the key button. The red transmit indicator will light up when the transmitter is keyed.

PRESS TO TALK-RELEASE TO LISTEN

TRANSMIT WITH TONE EQUIPMENT

When the radio is equipped with sequential tone equipment, the loudspeaker IN/OUT button must be pressed to open the loudspeaker. The green call indicator will then start flashing, indicating that the loudspeaker is open. When the channel is clear, the call can be initiated by pressing the tone transmit key, for transmitting a tone call to the base station, in order to open the base station loudspeaker. When contact with the base station is established, the conversation can continue by using the normal transmitter key button on the microphone.



Version
One channel with tone equipment

STORNOPHONE 5000
Maintenance Manual
Section 2

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Storno

INSTALLATION

STORNOPHONE 5000

GENERAL

Proper installation of the Stornophone 5000 radiotelephone is most important as its performance can be seriously impaired if the installation work is done without due care. The instructions should be read carefully and followed by the person installing the equipment. As precise instructions for all types and models of vehicles are impossible to give, and customer requirements may differ, all instructions, illustrations and examples in this chapter must be adapted to the actual installation.

UNPACKING

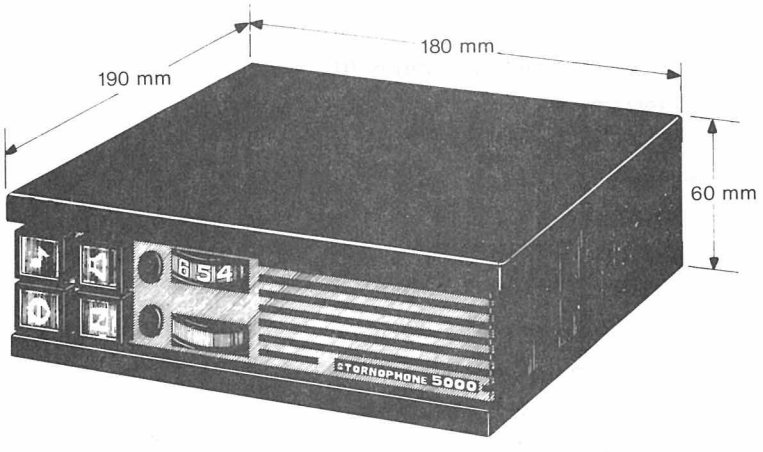
Each shipment should be checked against the packing list or invoice when arriving, and Storno must be notified immediately of any damage or shortage.

MOBILE INSTALLATION

Before the installation commences the cable run should be desided. The following hints should be noted:

- the cables shall be as short as possible.
- the cables shall be kept away from moving parts as handbrake, shock absorbers etc.
- the cables shall not run near the engine, exhaust manifold, pipes, and other hot items.
- the cables should, whenever possible, be run in parallel with existing cables and through the same holes in the chassis and car body. Suitable grommets must always be used if special holes are drilled in the metal work.
- the cables shall not be run externally underneath vehicles and cable clamps shall be used whereever the cable is likely to sag.
- to ensure that cables are not strained sharp bends should be avoided.
- the fuse in the battery cable should be placed as close to the battery as possible.

Volume: 2.0 litre
Weight: 1,8 kg



POSITIONING

When selecting a position in the vehicle to install the transmitter/receiver unit several important points should be noted:

- the unit must be allowed to dissipate heat
- the unit must be within convenient reach of the operator.
- the unit must not be liable to cause damage to the operator or passengers in case of an accident.

TEMPERATURE

The Stornophone 5000 circuitry is designed to operate over a wide range of temperature and the case is designed to provide maximum heat dissipation without vents. The ambient temperature during operation should normally not exceed $-30^{o}C$ to $+60^{o}C$. In cases of operation in hot climates adequate ventilation must be provided.
The equipment can be stored at higher or lower temperatures without damage.
Sufficient space must be left to enable a service engineer to remove the equipment and the cables shall be left free for the unit to be removed from its cradle.

INSTALLATION MATERIAL

Mobile operation of the Stornophone 5000 requires the following accessories:

MK5001	Installation kit containing: 8-position connector housing with crimp terminals 2-position connector housing with crimp terminals UHF antenna connector Power Supply cable Fuse holder 2 fuses, 8 A Cable eyes
MN5001	Cradle for the transmitter/receiver unit consisting of two parts locked together by a screw.
MN5002	Mounting cassette for the radio cabinet (see mechanical layout).
MN704	Mounting bracket for the radio cabinet.

All cradles allow the radio to be fixed in 36 different angles and positions.

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.
MC5001	Fist microphone with PTT button and hook.
HS5001	Retainer 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.
Antenna	Various types are available, refer to Storno Antenna Sales Programme.

Mobile antennas are normally supplied with adequate lengths of coaxial cable.

OPTIONS

HS5002	Retainer for MC5001 with switches.
HS5004	Retainer for MC5002, with hook switch.
MT5001	Microphone with retainer. The retainer contains a microswitch which is used to switch off the internal loudspeaker, when the microphone is lifted.
SU701	Keying switch, long lever
SU702	Keying switch, short lever
SU704	Switch circuit for autoradio mounting.
SU5003	External alarm with timer (Horn Alarm).
LS701	External loudspeaker
CC5001	Cable with fuse for installations using the ignition switch for turning the radio on and off.
PS702	Voltage regulator for 24 V DC installations (busses, vessels, heavy trucks, etc.).
PS704	Voltage regulator for 24 V DC installations (busses, vessels, heavy trucks, etc.).

Assemble and install the equipment as outlined on the installation diagram, refer to D402.612.

PLACING THE ANTENNA

The antenna should be placed as high and as much in the clear as possible in order to ensure the best matching and radiation pattern. On a vehicle, the roof must be considered the best place for the antenna. If the roof is non-metalic, a sheet of aluminium foil, at least 1 square metre in size, shall be glued to the roof below the antenna provided that the vehicle fittings make it possible. On passenger cars, the boot cover is an alternative place for the antenna although this will impair its efficiency and introduce an unfavourable directivity. Hence the latter solution should be chosen only if these factors are of secondary importance, i.e. where maximum operating range is not a significant requirement.

All Storno standard antennas can be installed from the outside without need for drilling through the upholstery, if any.

Antennas supplied by Storno have an installation instruction packed with each unit.

The coxial antenna cable, after having been routed to the radio unit, should be cut to length and fitted with the antenna connector, type PL259. The connector is a crimp-on type and hence soldering is not necessary.

If the antenna whip length must be cut to match the operating frequency, the transmitter frequency is the determinant. Refer to enclosed instructions
For multichannel operation the mean frequency is calculated.

FIXED INSTALLATIONS

Fixed operation (base station) of the Stornophone 5000 requires the following accessories:

MC703a	Desk microphone with PTT button
MC704	Microphone for fixed mounting. A bracket with rubber shock mounts are included.
MK704	Mounting kit consisting of 2 flexible tubes, used for mounting the MC704 in close-talk position.
MK5001	Refer to mobile installation for specification of contents.
MN703	Desk Stand
PS703	220 V AC Power Supply unit 10 W
PS5001	220 V AC Power Supply unit 25 W
Antenna	Various types are available, refer to Storno Antenna Sales Programme. Storno can also supply masts, towers, and special installation material on request.

The equipment should be assembled and installed as outlined on the installation diagram, refer to D402.644.

FUNCTIONAL TEST

When the Stornophone 5000 radiotelephone has been properly installed the following points should be checked:

- that the multiway connector is strapped according to the instructions and inserted in its socket.
- that the battery cable is connected.
- that the battery polarity is correct.
- that the fuses are inserted in their holders and are of correct value.
- that the antenna and the antenna connector are properly connected.
- that the channel selector, if any, is set to the operating channel.

TEST CALLS

Turn the radiotelephone on and perform test calls with the associated base(mobile) station to ascertain that transmission quality is good and that reception is good.
In systems with selective calling the loudspeaker on/off button must be pressed to check if the channel is free before transmitting commences. When the channel is clear, the tone signal is transmitted, whereupon the base (mobile) station should reply, reporting the strength and quality of the signal. The station is then requested to call, and the loudspeaker on/off button is pressed to turn the loudspeaker off. On reception of the call from the base station (mobile) the loudspeaker will be switch on and subsequent messages are transmitted without use of the selective calling.

MODULATION SENSITIVITY ADJUSTMENT

The microphone amplifier gain is adjusted by means of a potentiometer so that the speach level is set for correct modulation of the transmitter. This is best achieved by using the operator's voice.
The potentiometer must not be set so that the ambient background noise is able to modulate the transmitter. If the speech/ noise level is too low, then the microphone must be brought closer to the operator. Fist microphone MC5001 need not be adjusted.
Too high sensitivity will cause the message to be broken up and if it is too low, the message will be clear but weak. The optimum adjustment is found when loud shouting into the microphone just causes the message to break up.

NOISE SUPPRESSION

Noise interference in mobile radio communication equipment can either be caused by the vehicle's or vessel's own noise sources or caused by other sources such as other vehicles, electrical generators, electrical wires, X-ray apparatus, etc.

The external noise cannot be avoided, but care has been taken in the design of STORNO radiotelephones to reduce the effect as much as possible. Such noisy periods can be an annoyance, but will normally be of short duration if the vehicle is on the move.

The electrical noise generated by the vehicle's or vessel's own electrical system can often be suppressed sufficiently by simple means.

It should be noted that as long as the radiotelephone is being operated close to the base station the noise will normally not be noticed. The noise will only be heard in the loudspeaker, when the equipment moves away from the base station, where the received signal is somewhat weaker.

Complete noise suppression of an electrical system can be very difficult in certain cases, but normally it is possible to achieve satisfactory results if the simple advice given below is followed.

Moreover, recommendations about noise-suppression published by manufacturers of electrical automobile accessories and noise suppression components (such as Bosch, Lucas, etc.) should be studied.

IGNITION NOISE

The most common noise source is the ignition system of an engine, and this noise is characterized by a regular ticking sound, which is syncronized with the motor revolutions. In case the vehicle is not sufficiently noise suppressed from the factory it is necessary to insert suppression resistors in series with each spark plug or replace the spark plugs with types having builtin resistors. If suppression resistors are used wirewound resis-

Further noise suppression may be obtained by inserting a suppressor resistor in the cable between the ignition coil and the distributor as close to the latter as possible. The best solution is to replace the distributor rotor with a special rotor having a built-in resistor.

Screening of noisy components is expensive, but may be necessary in certain cases. Metal components, or metal coated components, such as distributor lids are used to incapsulate the noise source.

If the steps mentioned do not result in a satisfactory noise suppression, a 0, 1uF coaxial capacitor must be mounted between the primary of the ignition coil and chassis. The capacitor should be fitted near the coil with the chassis wire as short as possible.

Finally, it should be born in mind that dirty or pitted distributor contacts may cause noise similar to ignition noise.

Dynamo Noise

The dynamo noise is characterized by a whine, where the frequency and pitch is syncronized with the motor revolutions.
Normally this noise is due to arching between dirty or worn brushes and the commutator. Cleaning, or possibly, replacement of the carbon brushes will normally remove the noise.

In some cases it may be necessary to insert a noise filter in the dynamo circuit. A noise suppressor capacitor may be inserted in the lead from the ignition coil (connection to ignition switch) and in the battery lead from the dynamo terminal. Do not remove more insulating material than absolutely necessary in order to minimize the risk of shorting the circuit.

Other Noise Sources

Noise from the voltage regulator can be identefied by a rasping noise in the loudspeaker. This noise can normally be removed by mounting a coaxial capacitor in the dynamo lead, as close to the regulator housing as possible. The other end of the capacitor should be connected to chassis.

All electrical instruments and motors may introduce noise into the radiotelephone. The windscreen wiper motor can for example be suppressed by a conventional noise suppressor capacitor.

The different noise sources can easily be detected by switching on and off the suspected noise sources one by one. Other noise sources are the electric clock, the petrol gauge, the oil lamp, etc., and in all cases the noise can be sufficiently suppressed by correct use of capacitors.

The ventilator fan belt may be the cause of static noise. The cure is to replace the belt with one containing a graphite compound.

Tyre statics can sometimes produce interference and in such cases improvement may be obtained by mounting special shorting springs on each wheel.

Static noise may also be due to a nonmetalic suspension of the engine. Metal braids mounted between the engine and the chassis, or the firewall, will remove the noise. Corroded joints of existing braids may also cause static noise.

Storno

Different proposals for placing the radio telephone.

These are recommended, but other may be used depending on the type of vehicle. However, if a transfer from one vehicle to another is demanded, without using tools, installations must be fitted in both cars and the positioning in Fig. 1, Fig. 2, or Fig. 4 be used.

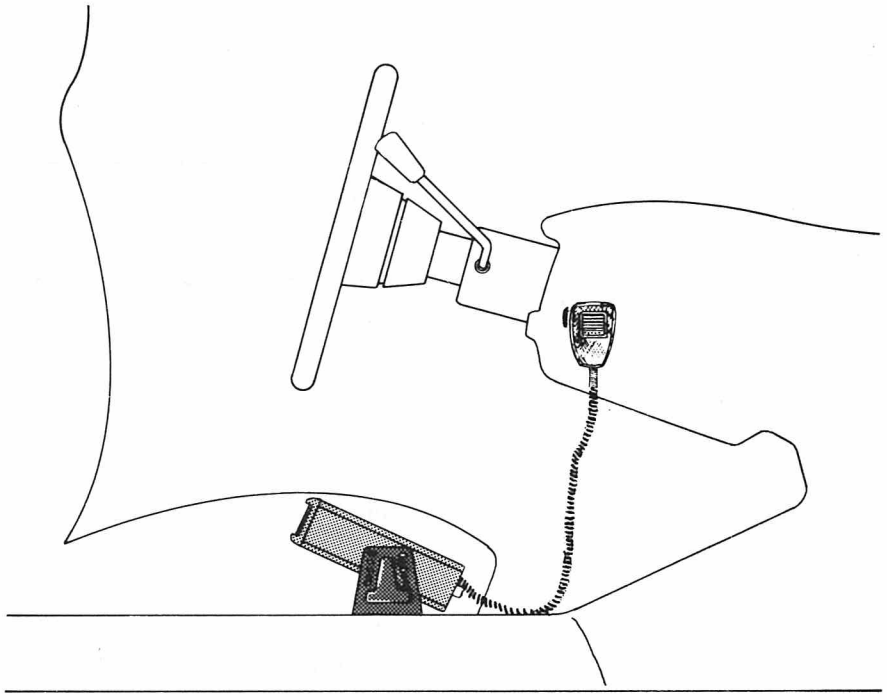


Fig. 1

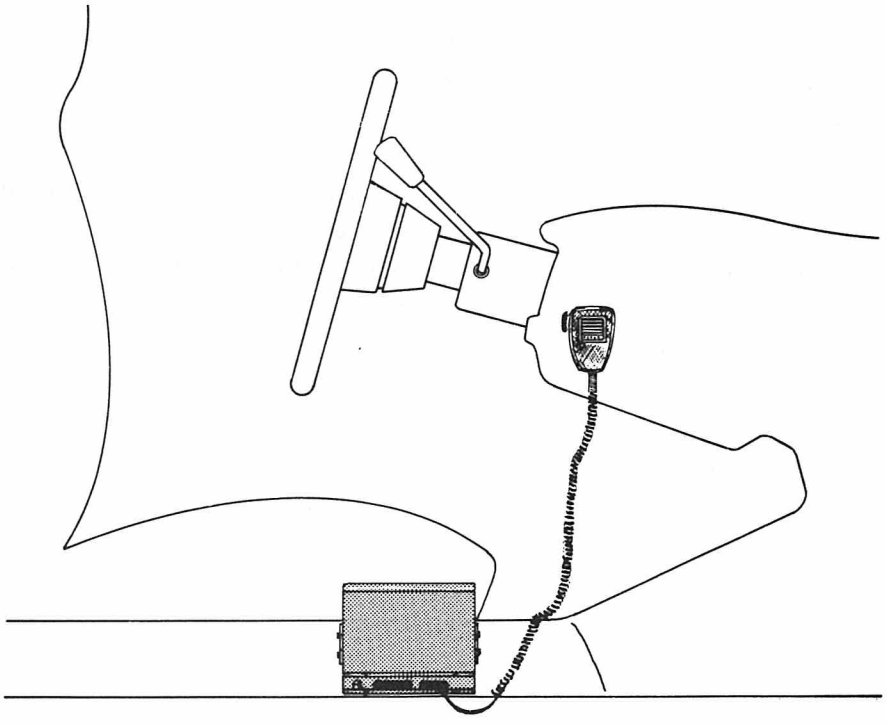


Fig. 2

Storno

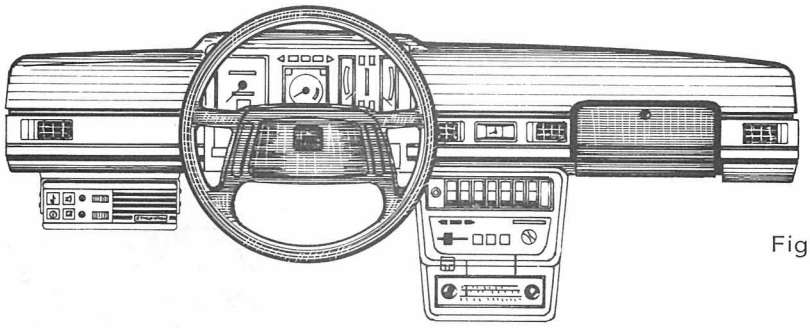


Fig. 3

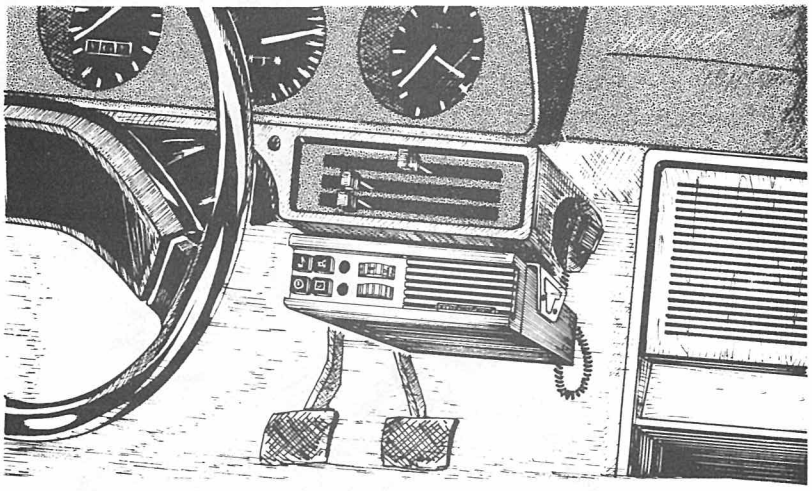


Fig. 4

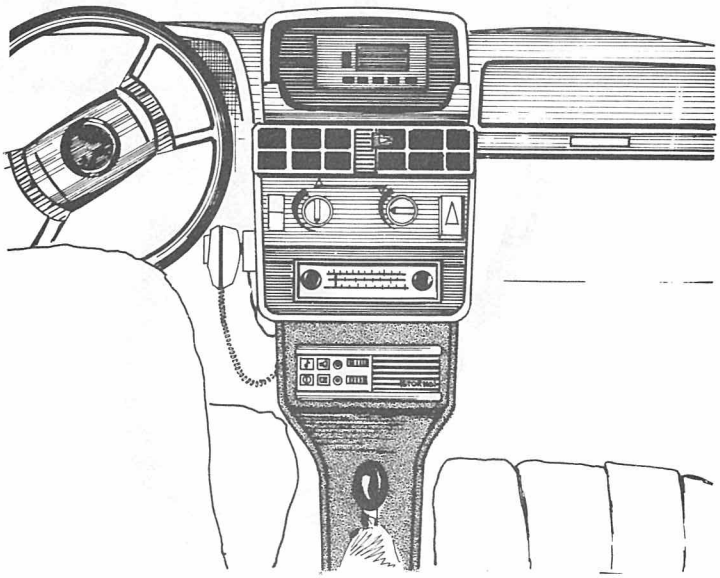


Fig. 5

Storno

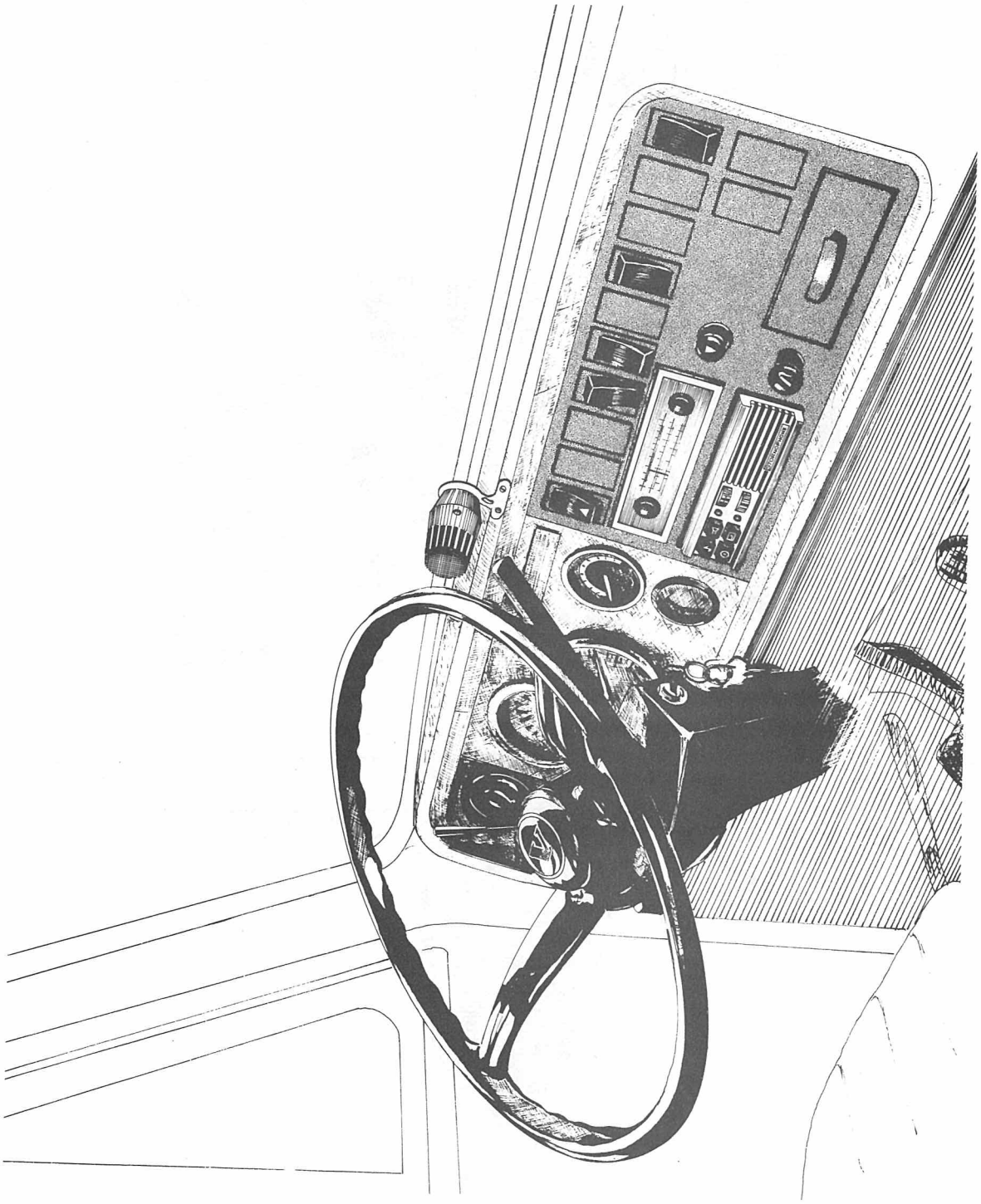
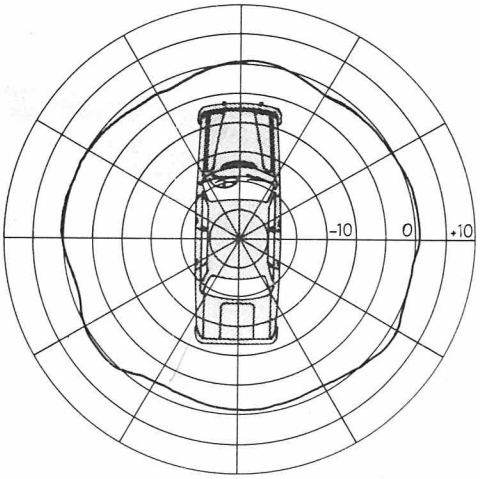


Fig. 6

If the antenna is mounted on the boot cover, or near the edge of the roof, the radiation pattern will change considerably. Fig. 7, Fig. 8, and Fig. 9 show the attenuation for different mountings, related to a $\lambda/2$ dipole. Reduction in coverage occurs as a result, but it is possible to compensate for higher losses by using 5/8 λ antennas which have approx. 2dB gain. Especially in the case of boot cover mounting, antennas with gain should be used if the operating range is a significant requirement.

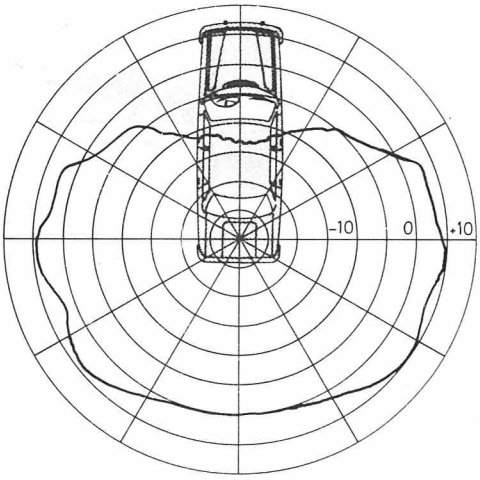
ATTENUATION RELATED TO $\lambda/2$ DIPOLE (0 dB)

160 MHz



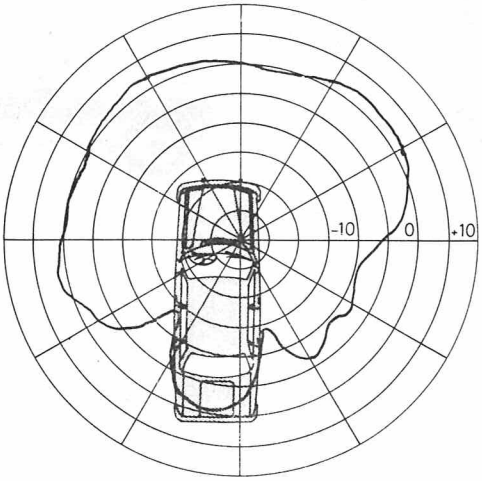
90°

160 MHz



90°

160 MHz



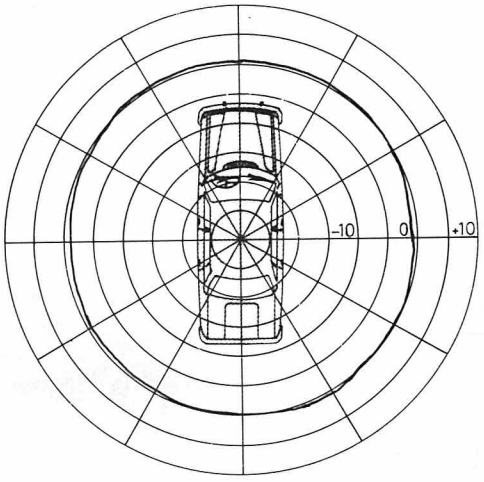
90°

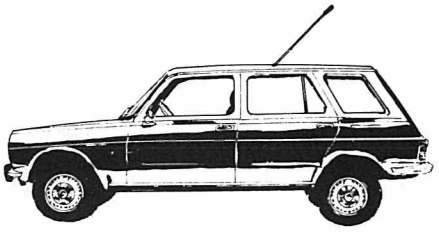
Fig. 7

Storno

ATTENUATION RELATED TO λ/2 DIPOLE (0 dB)

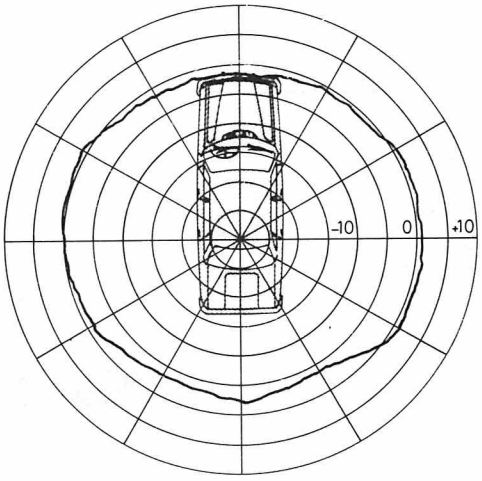
160 MHz





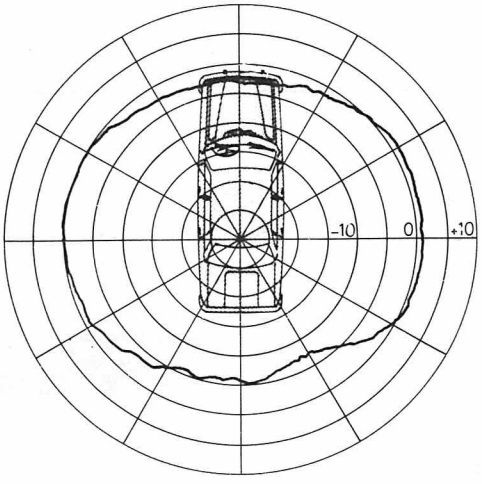
45°

160 MHz



90°

160 MHz

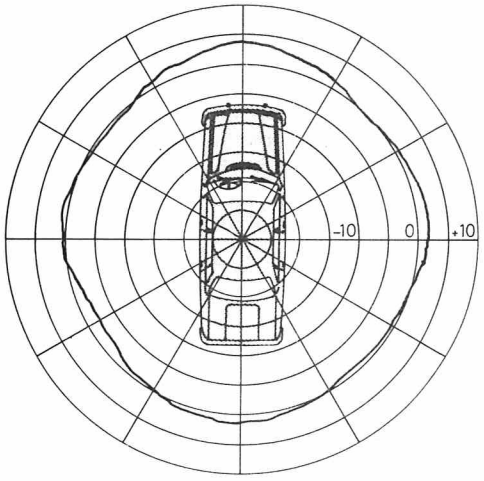


45°

Fig. 8

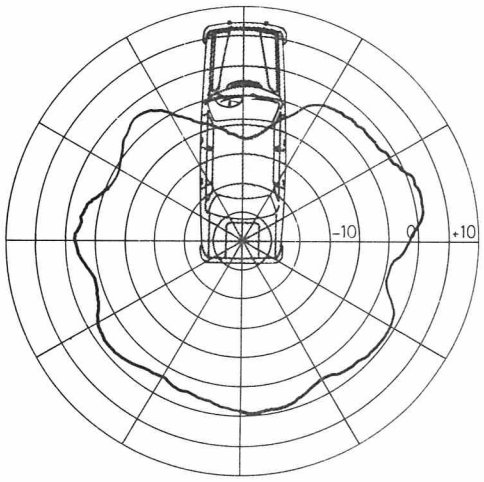
ATTENUATION RELATED TO λ/2 DIPOLE (0 dB)

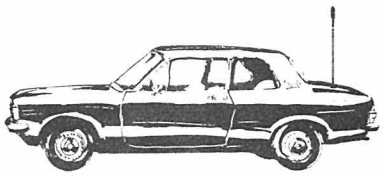
160 MHz



90°

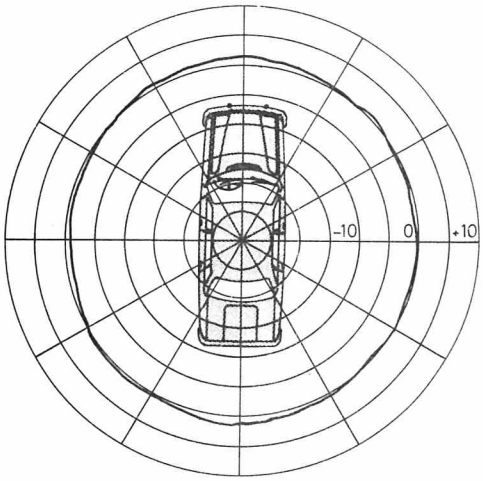
160 MHz





90°

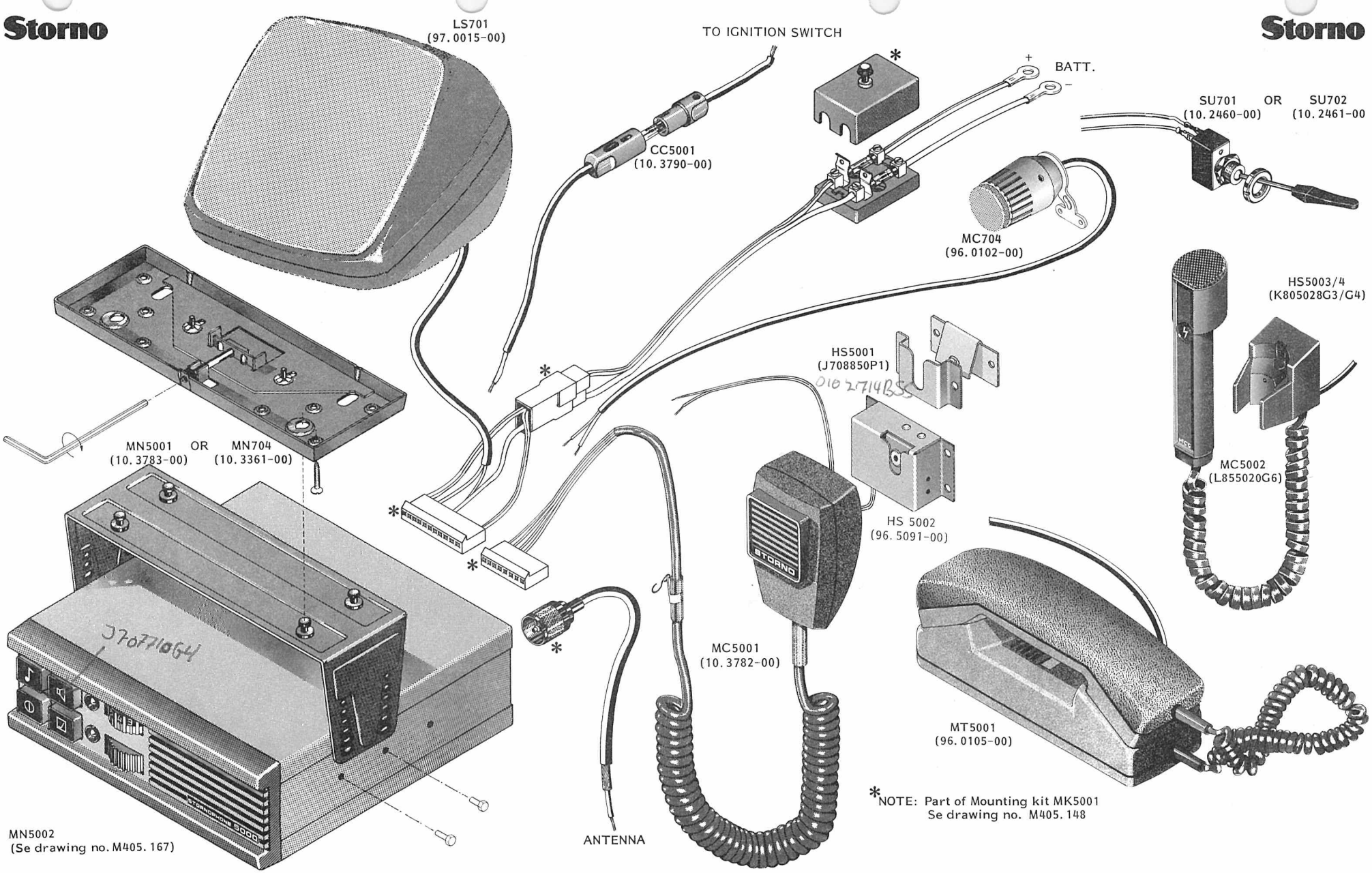
160 MHz



90°

Fig. 9

Storno

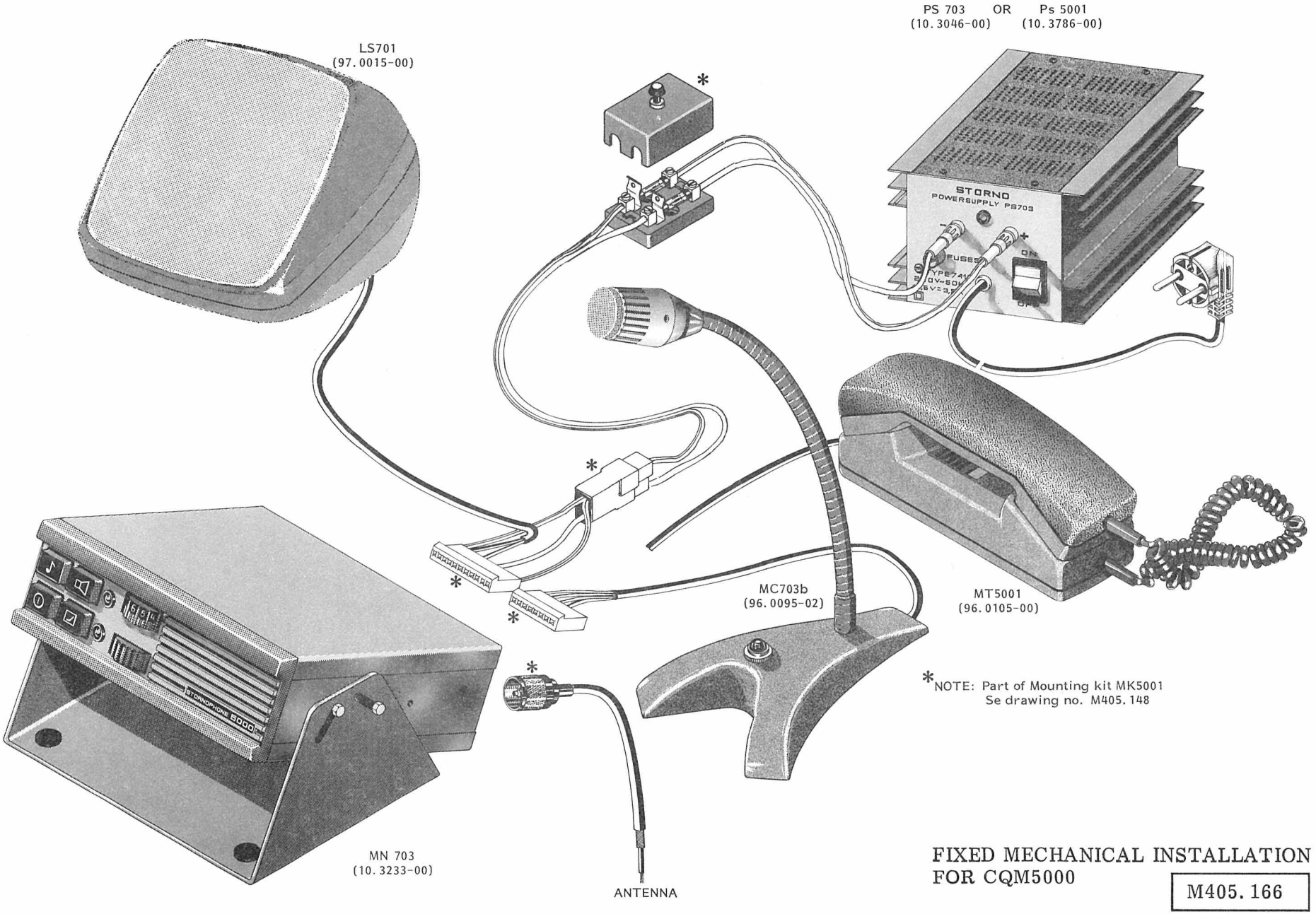


MECHANICAL INSTALLATION
FOR CQM5000

M405.165

Storno

Storno

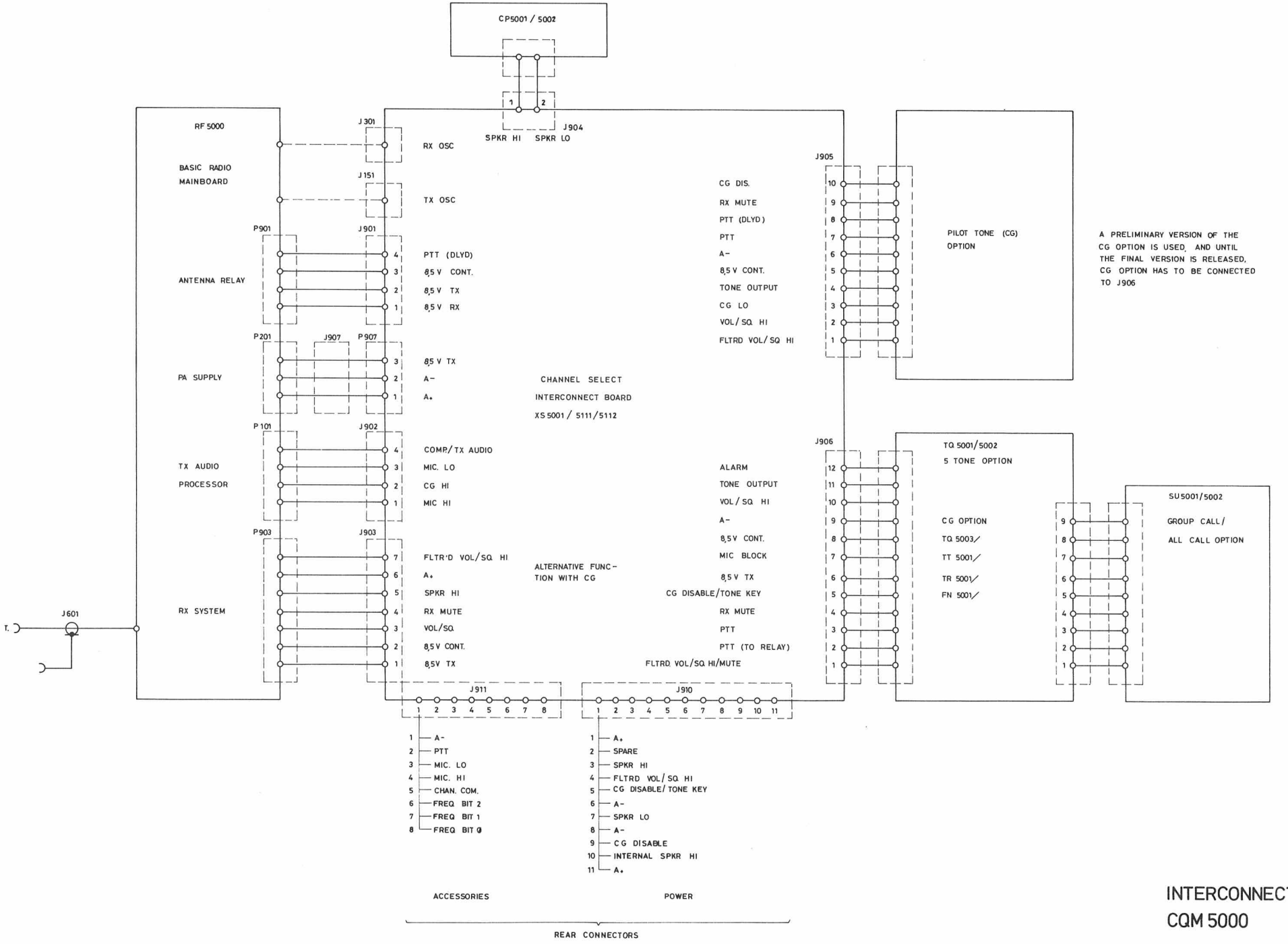


FIXED MECHANICAL INSTALLATION
FOR CQM5000

M405.166

Storno

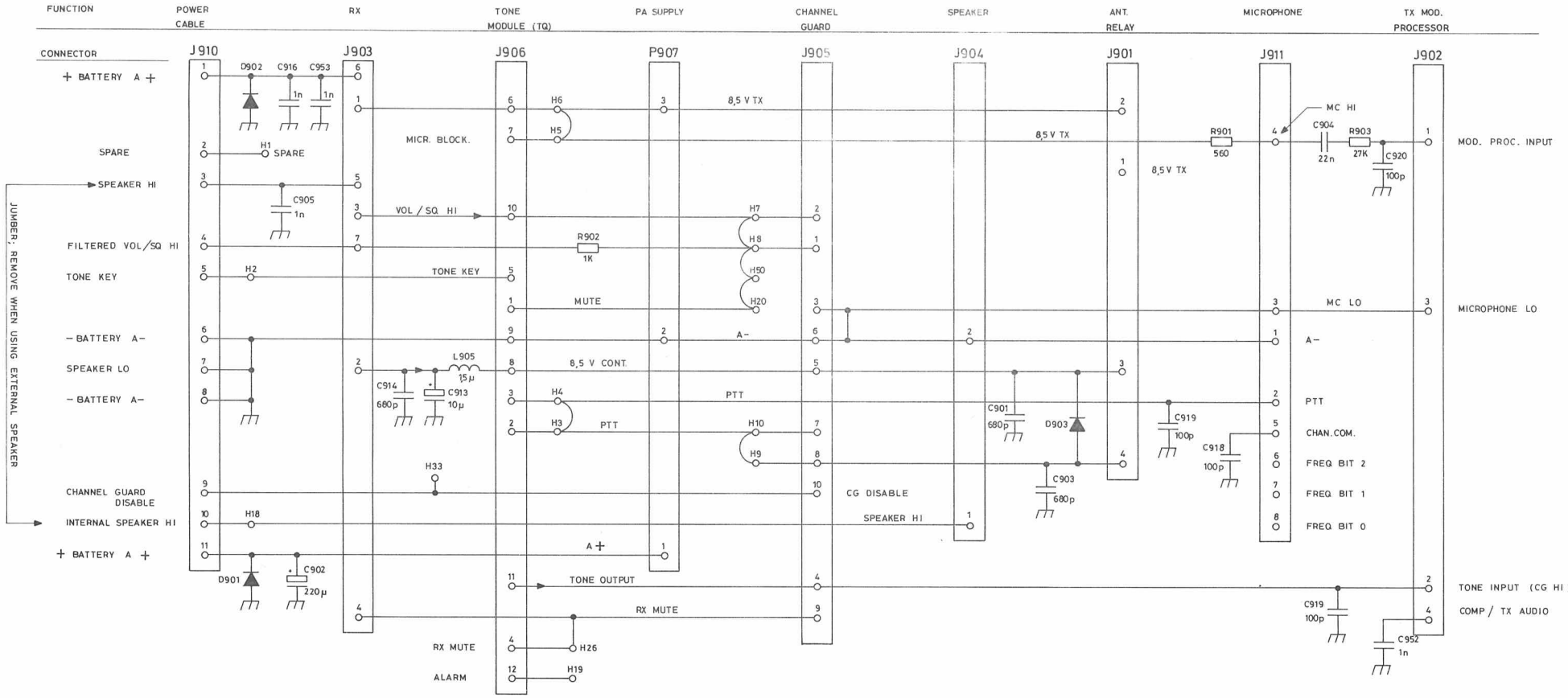
Storno

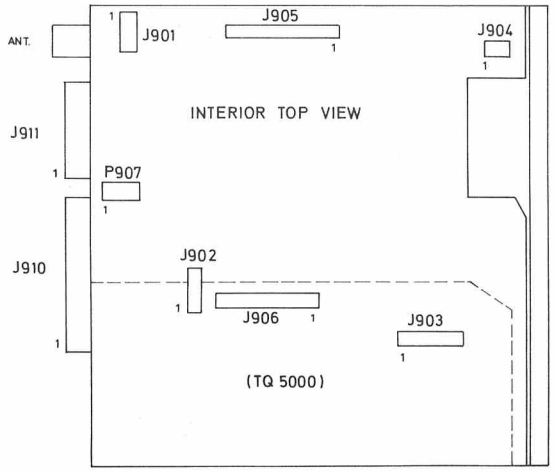


INTERCONNECT DIAGRAM

CQM 5000

D402.641/2





NOTES

ALL CONNECTORS SHOWN ARE ON THE XS 5000 BOARD

COMPONENTS SHOWN ARE PARTS OF THE XS BOARD

TONE OPTIONS	STRAPS				
	H3 - H4	H5 - H6	H7 - H8	H9 - H10	H20 - H50
T0 - NONE	+	+	+	+	+
T1 - TQ 5001	—	—	+	+	—
T2 - TQ 5002	—	—	+	+	—
T3 - TQ 5001 + SU 5001	—	—	+	+	—
T4 - TQ 5001 + SU 5002	—	—	+	+	—
T5 - TQ 5003	+	+	—	+	+
T6 - TR 5001	+	+	—	+	+
T7 - TT 5001	+	+	+	+	+
T8 - FN 5001	+	+	—	+	+

INSERT = +
REMOVE = —

INTERCONNECTION DIAGRAM CQM 5000

D402.695

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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: ±5kHz
CQM5113: ±4kHz
CQM5114: ±2.5kHz

Modulation Frequency Range
CQM5112: 300 - 3000Hz
CQM5113: 300 - 3000Hz
CQM5114: 300 - 2700Hz

Maximum RF Bandwidth
1.5MHz

Antenna Impedance
50Ω

Maximum Number of Channels
6

Supply Voltage
Minimum : 10.8V
Nominal : 13.2V
Maximum : 16.6V
Negative potential to chassis

Temperature Range
$-30^{o}C$ to $+ 60^{o}C$

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

Weight
1.8 Kg

RECEIVER

Sensitivity
12dB SINAD (EIA), ½e.m.f.
0.3uV (0.23uV)

Measuring conditions:
Δf. ±2/3 x Δf max; f_{mod} = 1kHz

20dB SINAD (CEPT) e.m.f.
CQM5112: 0.75uV (0.55uV)
CQM5113: 0.75uV (0.55uV)
CQM5114: 1.0uV (0.75uV)

Δf 60% x Δf max; f_{mod} = 1kHz.
Measured with psophometric filter.

Crystal Frequency Range

45.1 - 54.5MHz

Crystal Frequency Calculation (fx)

$$fx = \frac{Fs - 10.7}{3} MHz$$

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 Attennuation

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)

$fx = \frac{Fs}{3}$

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)

Storno

GENERAL DESCRIPTION

CQM5110

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.

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

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.

Storno

SU701
Transmitter keying switch for mounting on the steering coloum.

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.

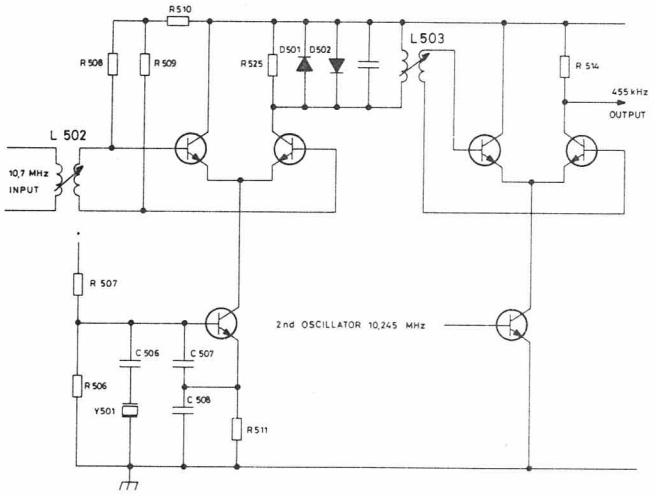
(refer to functional block diagram)

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

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 guadrature 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 charateristics 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 folfowing 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 deside 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.

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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 diviation 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 based 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.

Storno

A multifrequency board is required for more than one frequency channel. This board is available is two versions; one (XS5111) has space for accomodating 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 Co 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 fusable printed wiring path which will open in case of the ground wire being accidently 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 monolitic regulator. The regulator output is fixed at 8.5V by means of a factory adjusted resistor.

Storno

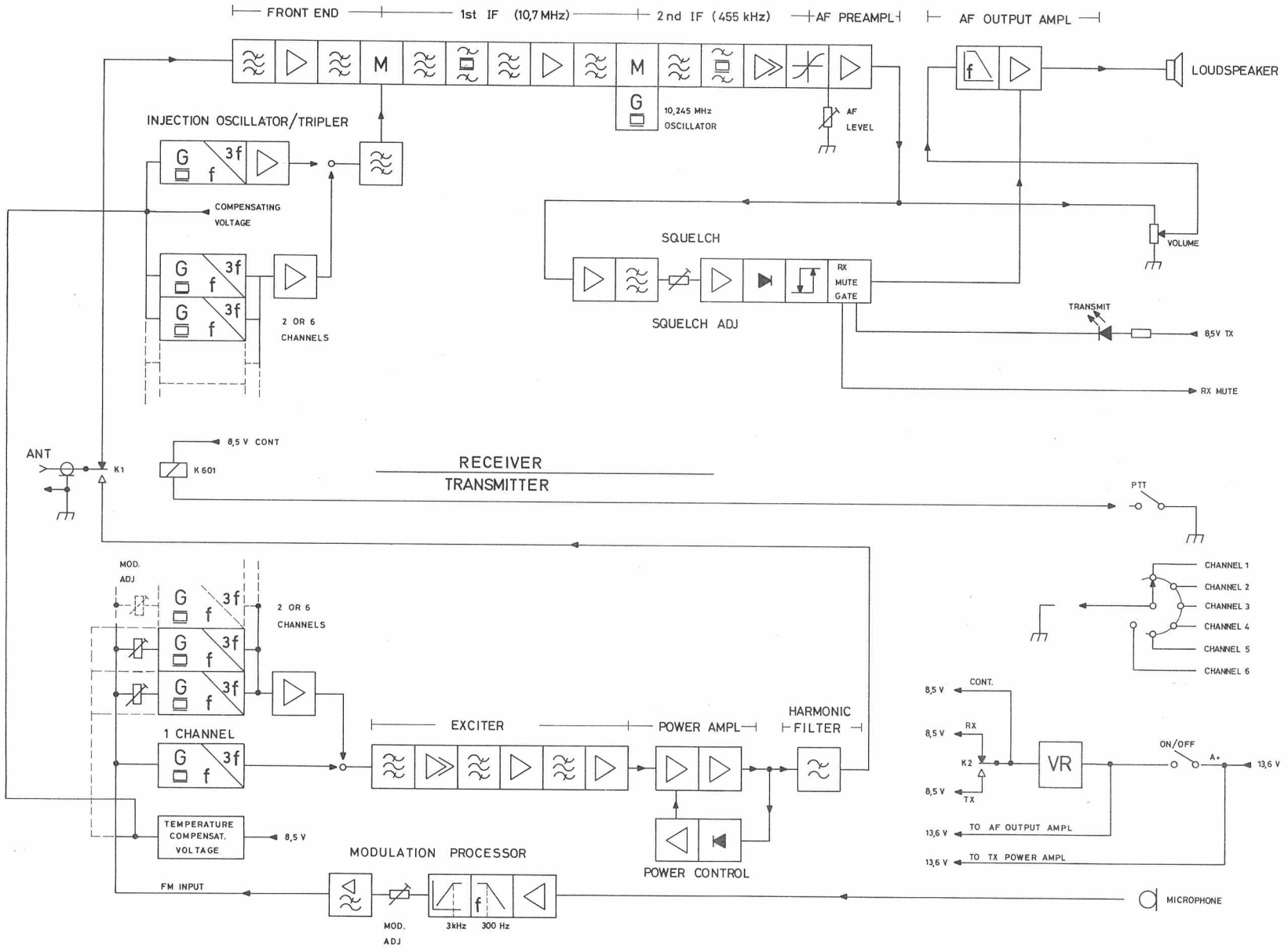
Regulated 8.5V is switched to either the receiver or the transmitter by the antenna relay. The antenna relay is also supplied by the 8.5V regulated.

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

D402.632

Storno

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	$R_{in} \geq$ 1Mohm
AC Voltmeter	Z_{in} >1Mohm//50pF
Multimeter	$R_i \geq$ 20Kohm/Volt
Distortion meter	e.g. Storno E11c
RF Watt meter	25 W/50 ohm/145-175MHz
RF generator	Z_{out} = 50 ohm; 145-175 MHz
10.7 MHz signal generator	e.g. Storno TS-G21B
Frequency counter with attenuator	Z_{in} = 50ohm; 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 V ± 0.15 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 m V

Repeat the procedure with the power supply adjusted for 10.8 V

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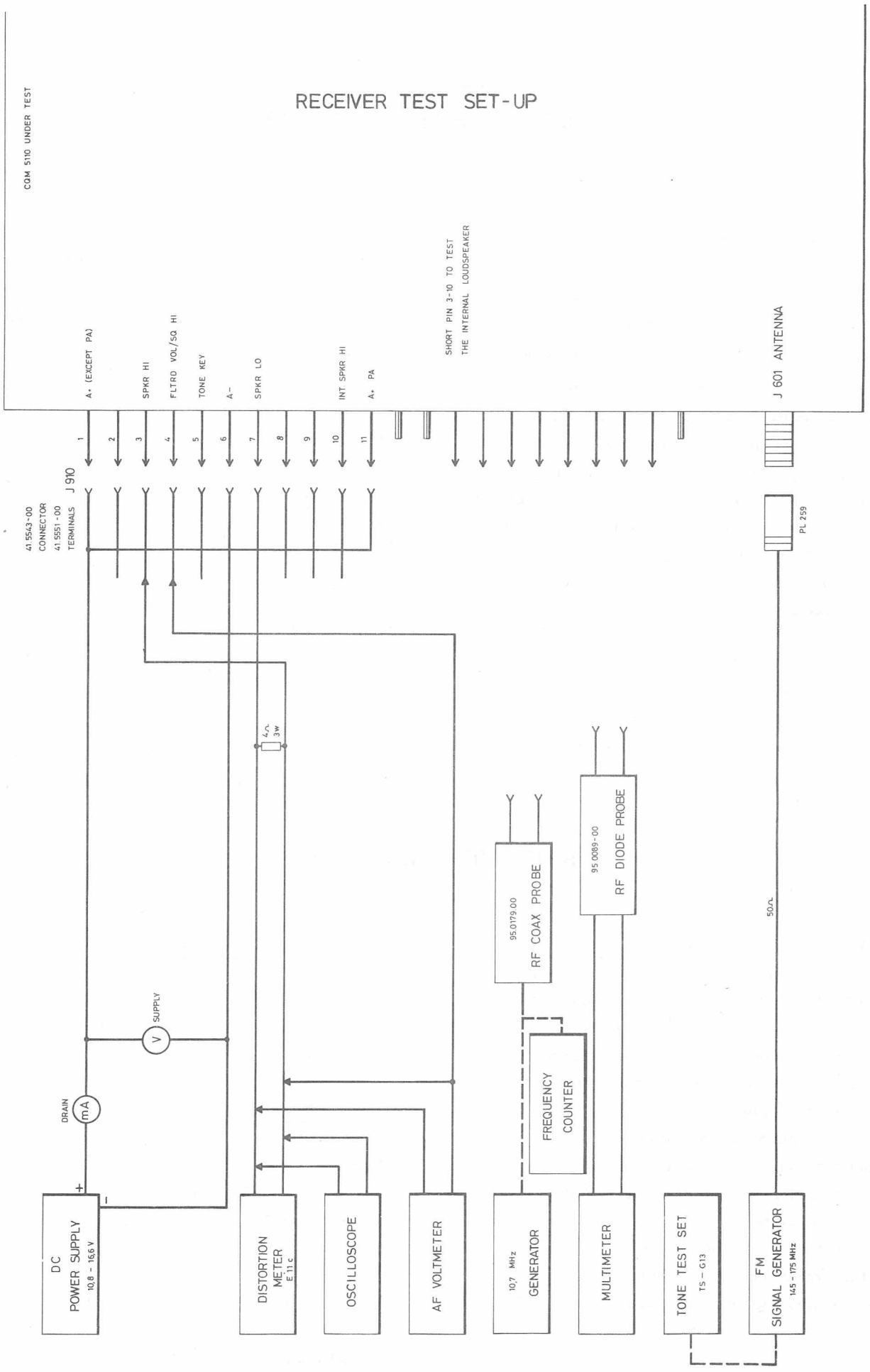
RECEIVER TEST SET-UP



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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: $\geq$ 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
$F_{antenna}$ 10,7 MHz

Single channel sets

Adjust L301 for the specified frequency ($3xf_x$)
This adjustment shall be performed at 25°C
Requirement: F_{nom} ± 0.4ppm (± 60 Hz at 150 MHz)

Multichannel sets

Adjust the following coils on the XS board to the specified receiver frequencies ($3xf_x$)

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

Requirement:
F_{nom} ± 0.4 ppm (± 60 Hz at 150 MHz)
ppm = parts per million = x 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.

Storno

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 = ± 3 KHz
CQM5113 = ± 2.4 KHz
CQM5114 = ± 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 ± 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 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 1000 uV of RF signal modulated with 1000 Hz at 2/3 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 immeadiately 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 2/3xΔfmax, 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$0.75uV (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$0.3uV ($\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, ΔF = 60% ΔF 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 incriase defelection is small and gently tuning si required. If the frequency is in the low end of the band is 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.

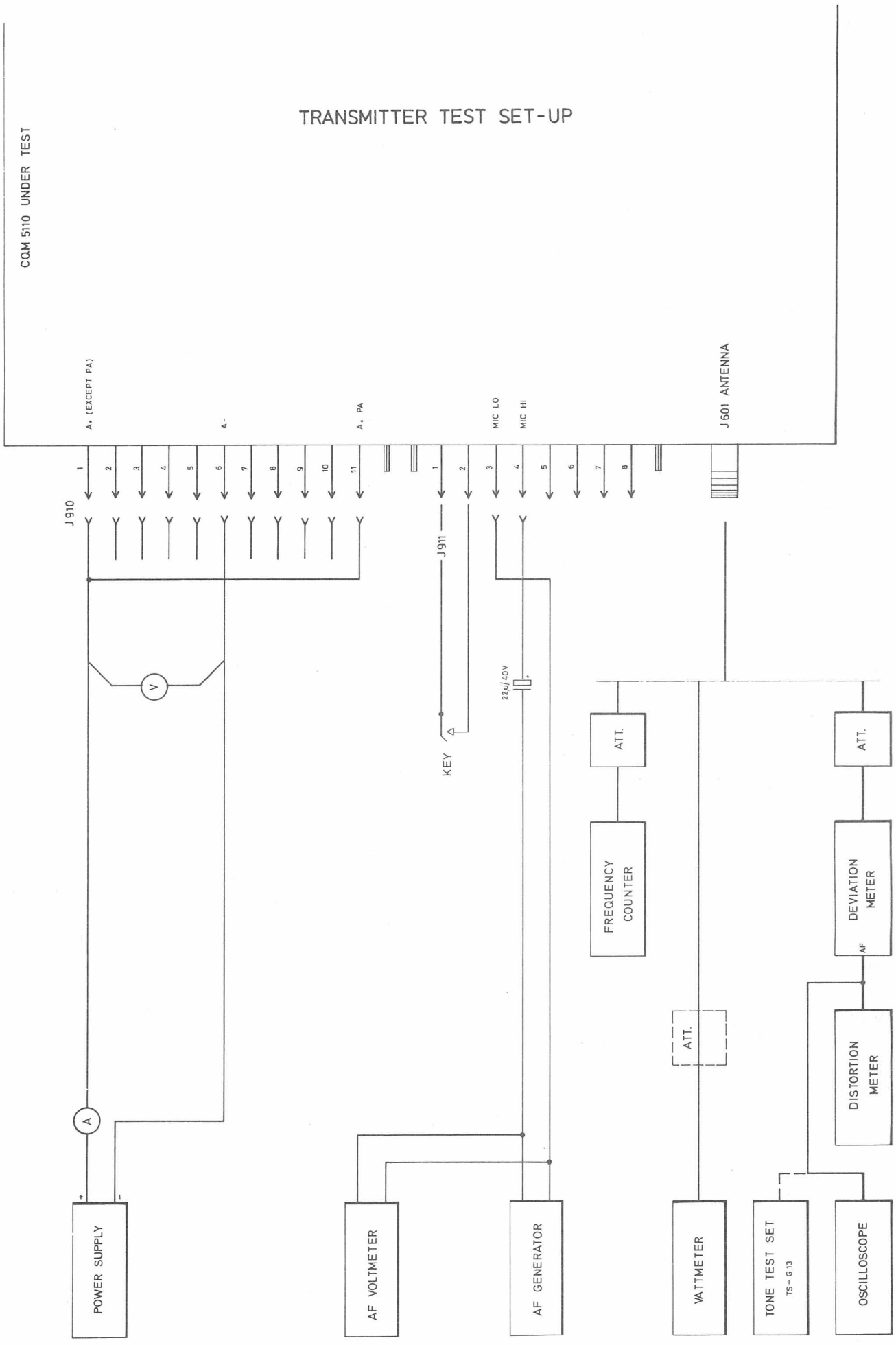
Multichannel sets

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

Storno

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 af 25°C.

Requirement: F_{nom} ±0.4 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} ±0.1dB.

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

Requirements (25W):

Voltage	Power	Current
16.6V	25W (ref)	≤5.8A
13.2V	≥24W	≤5.8A
10.8V	≥20W	≤5.8A

Requirements (10 W):

Voltage	Power	Current
16V	10W (ref)	≤3.2A
13.2V	≥9W	≤3.2A
10.8V	≥8W	≤3.2A

Requirements (6W):

Voltage	Power	Current
16V	6W (ref)	≤2.6A
13.2V	≥5.5W	≤2.6A
10.8V	≥5.2W	≤2.6A

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 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
CQM5112	30/25kHz	±5kHz
CQM5113	20kHz	±4kHz
CQM5114	12.5kHz	±2.5kHz

Requirement
Difference between + and - deviation: ≤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	: ±3.0kHz
CQM5113	: ±2.4kHz
CQM5114	: ±1.5kHz

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

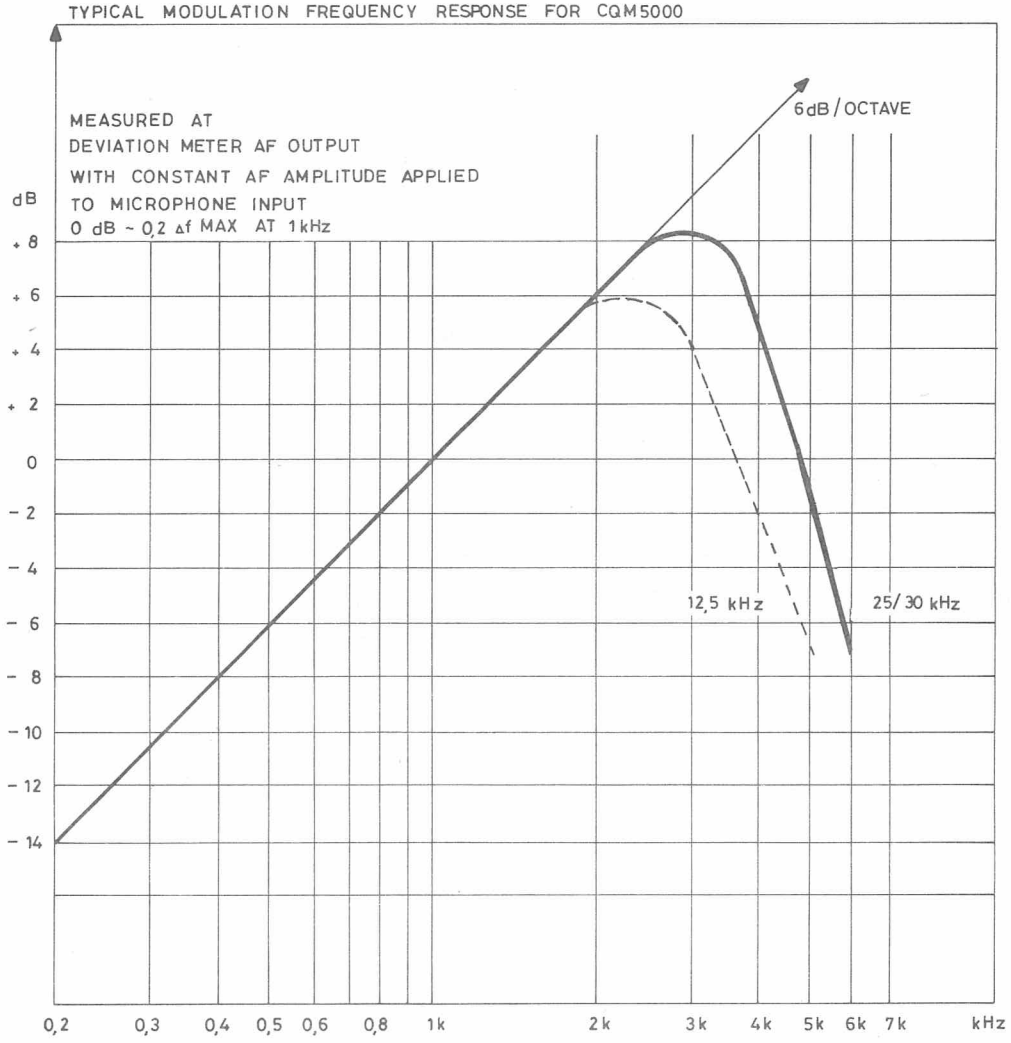
Requirements:
Modulating signal: 75mV ±2dB
Distortion: ≤7%
(measured without deemphasis)

Modulation frequency response
Set the AF generator to 1000Hz.
Reduce the AF generator output until a deviation of 0.2 x Δf max is obtained on the deviation meter.

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

Vary the frequency of the generator and note the deviation changes as refered 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.

TYPICAL MODULATION FREQUENCY RESPONSE FOR CQM5000



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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.

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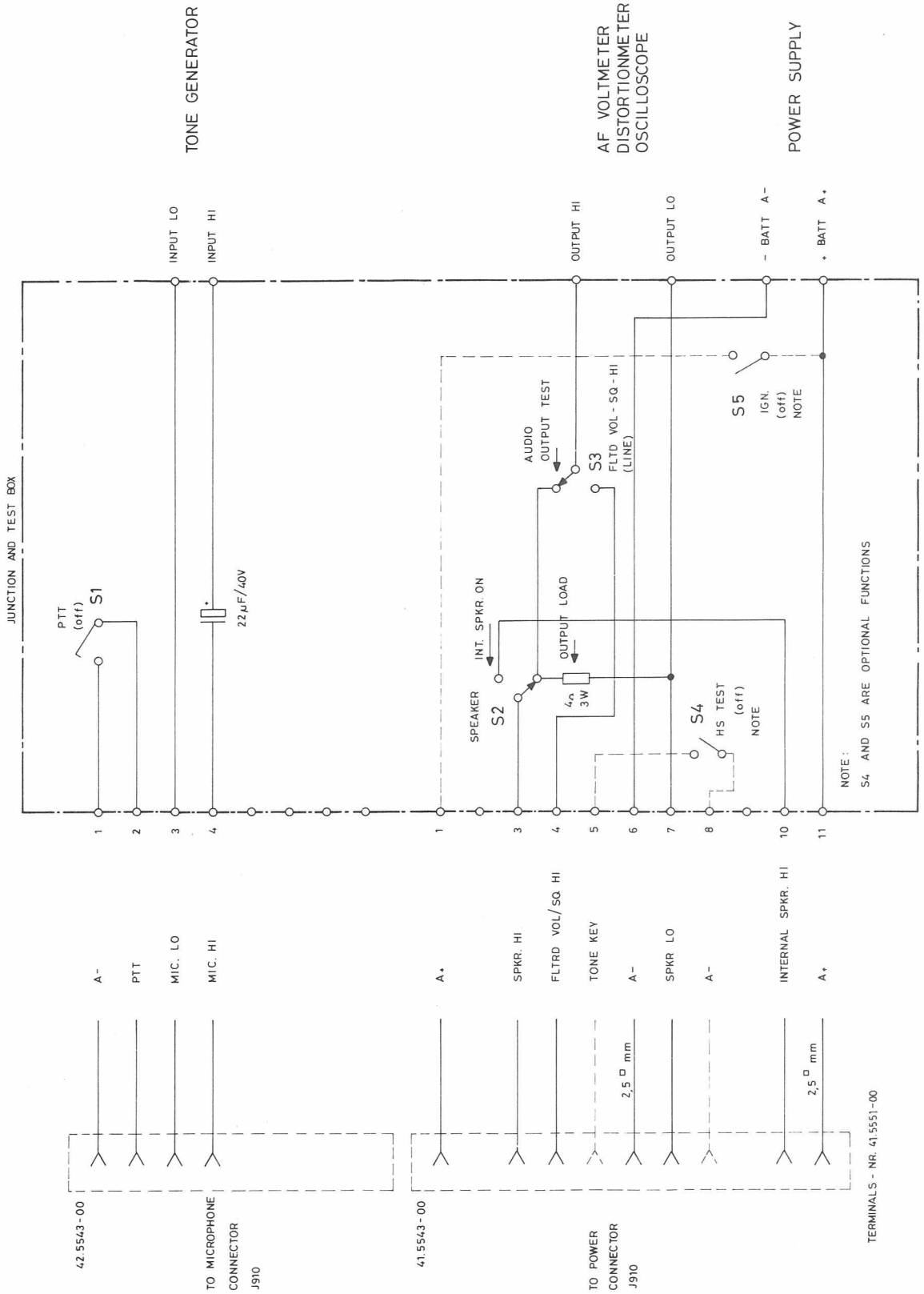
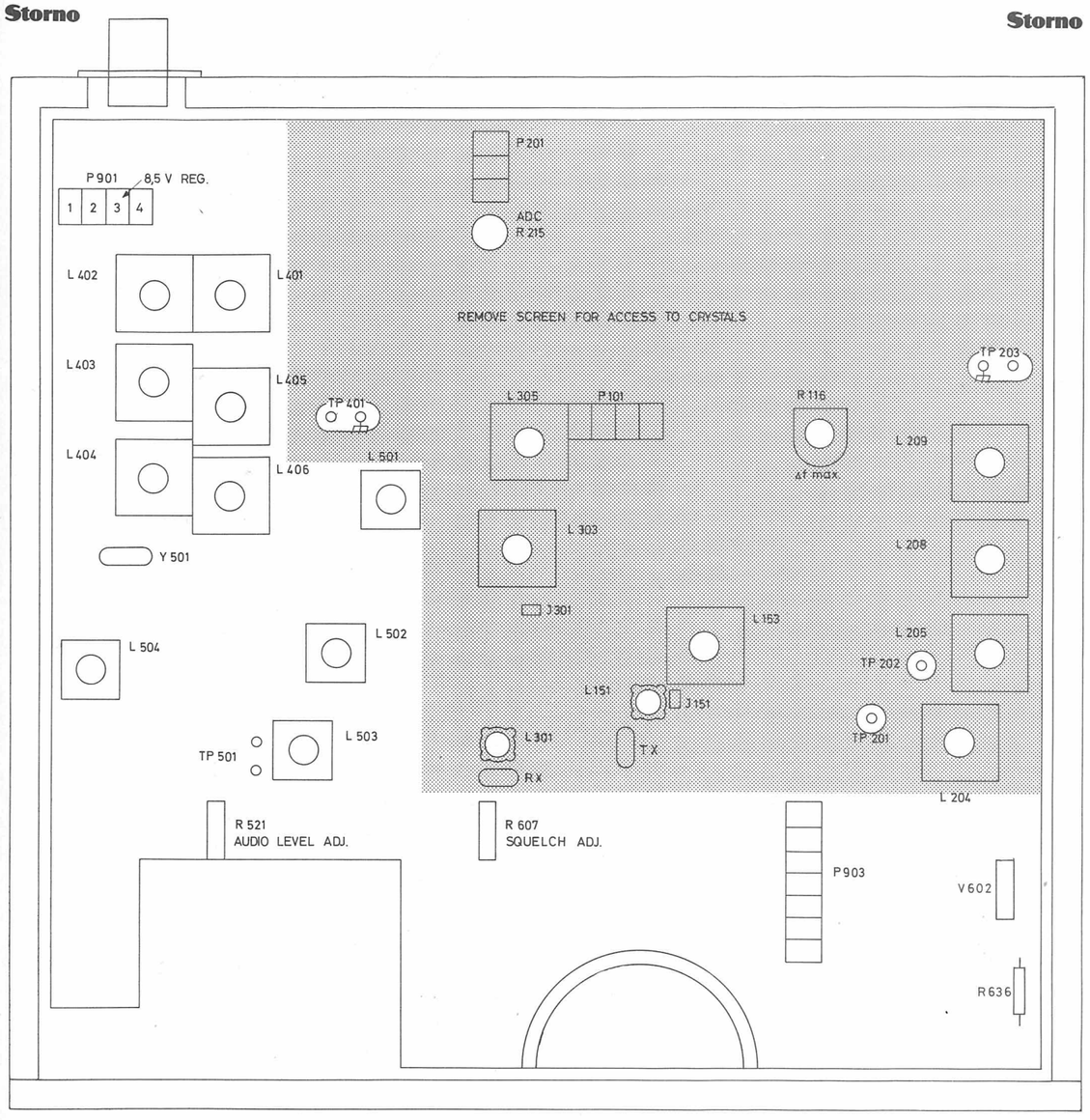


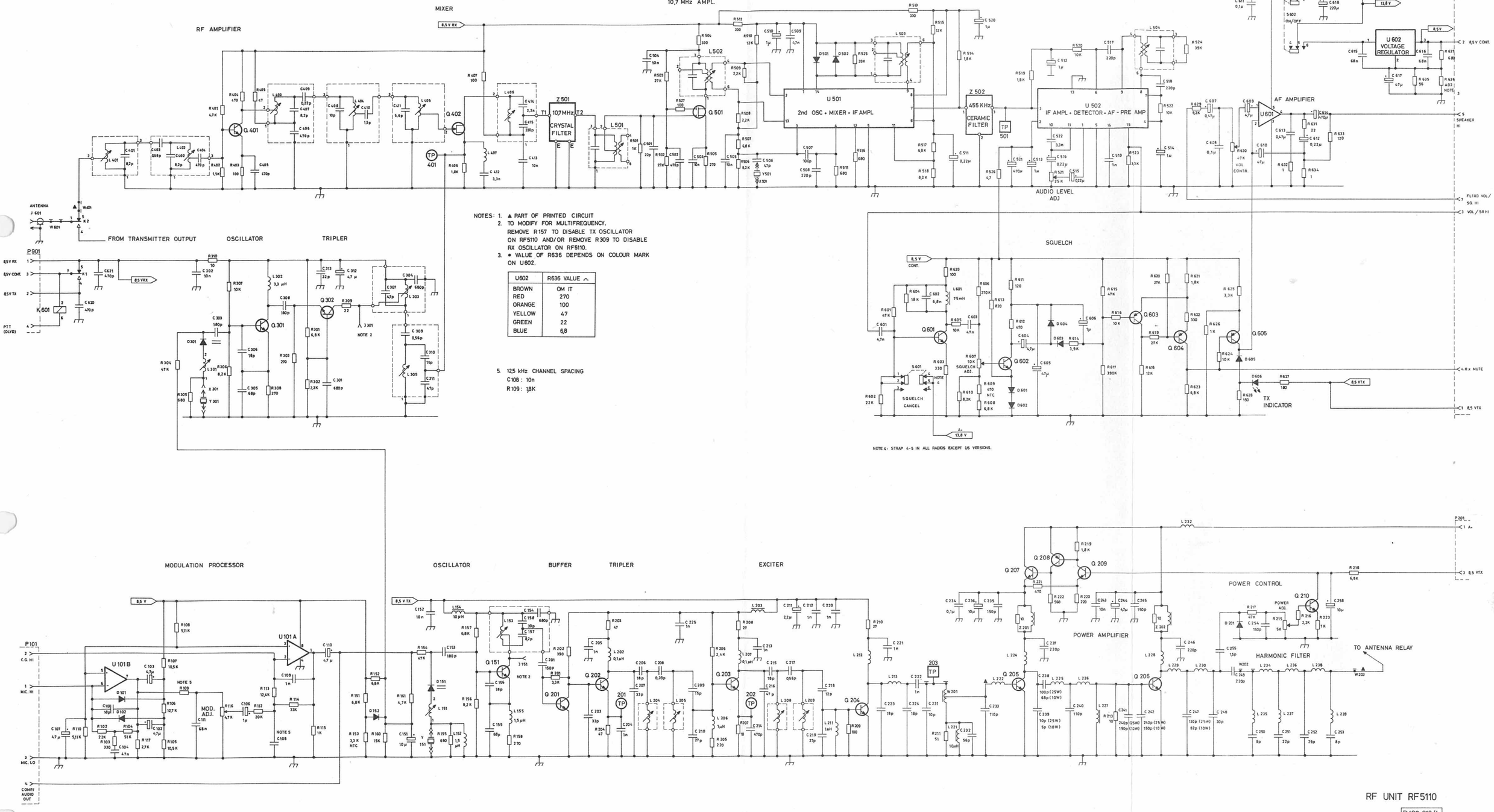
CQM 5000

Storno



ADJUSTABLE COMPONENTS AND TEST POINTS ON RF 5110

D402.623



NOTES: 1. ▲ PART OF PRINTED CIRCUIT
2. TO MODIFY FOR MULTIFREQUENCY, REMOVE R157 TO DISABLE TX OSCILLATOR ON RF5110 AND/OR REMOVE R309 TO DISABLE RX OSCILLATOR ON RF5110.
3. • VALUE OF R636 DEPENDS ON COLOUR MARK ON U602.

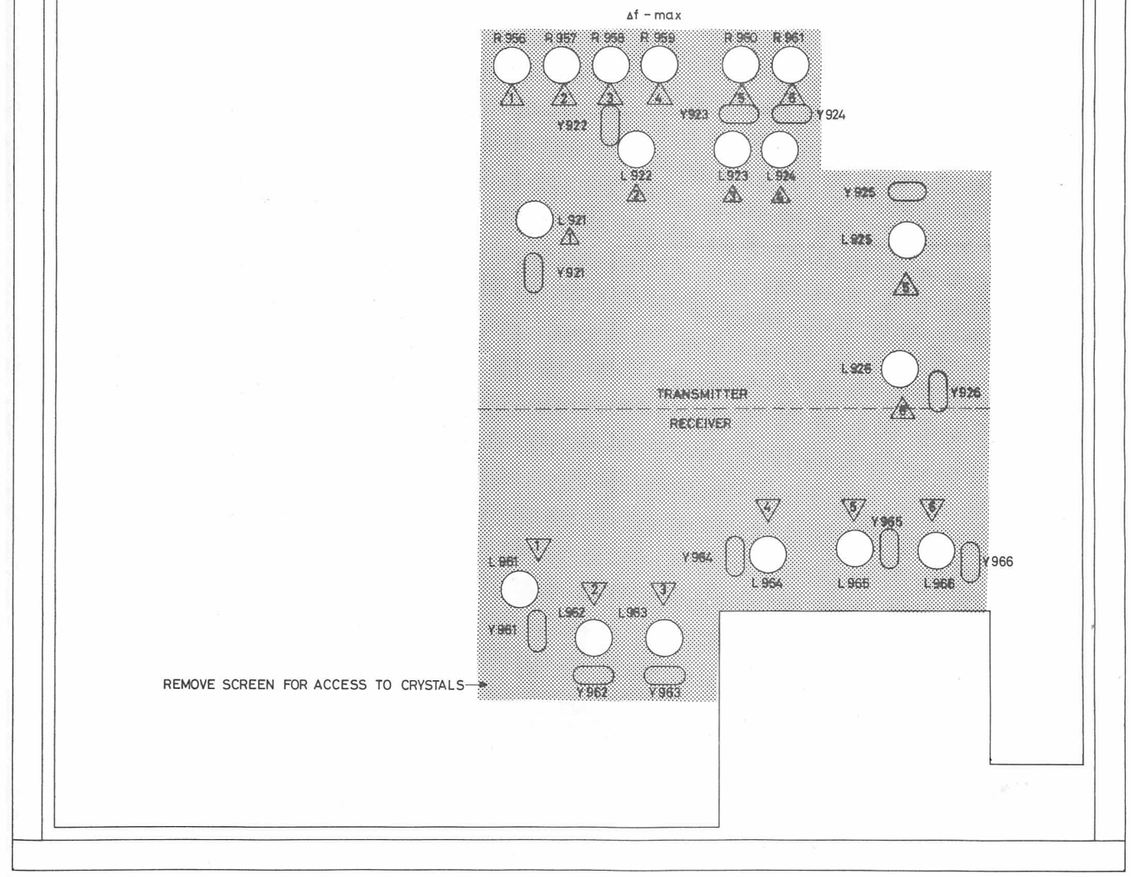
U602	R636 VALUE ∧
BROWN	OM IT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6,8

5. 12,5 kHz CHANNEL SPACING
C108 : 10n
R109 : 18K

RF UNIT RF5110

D402.613/4

Storno



▽ = RECEIVER CHANNEL

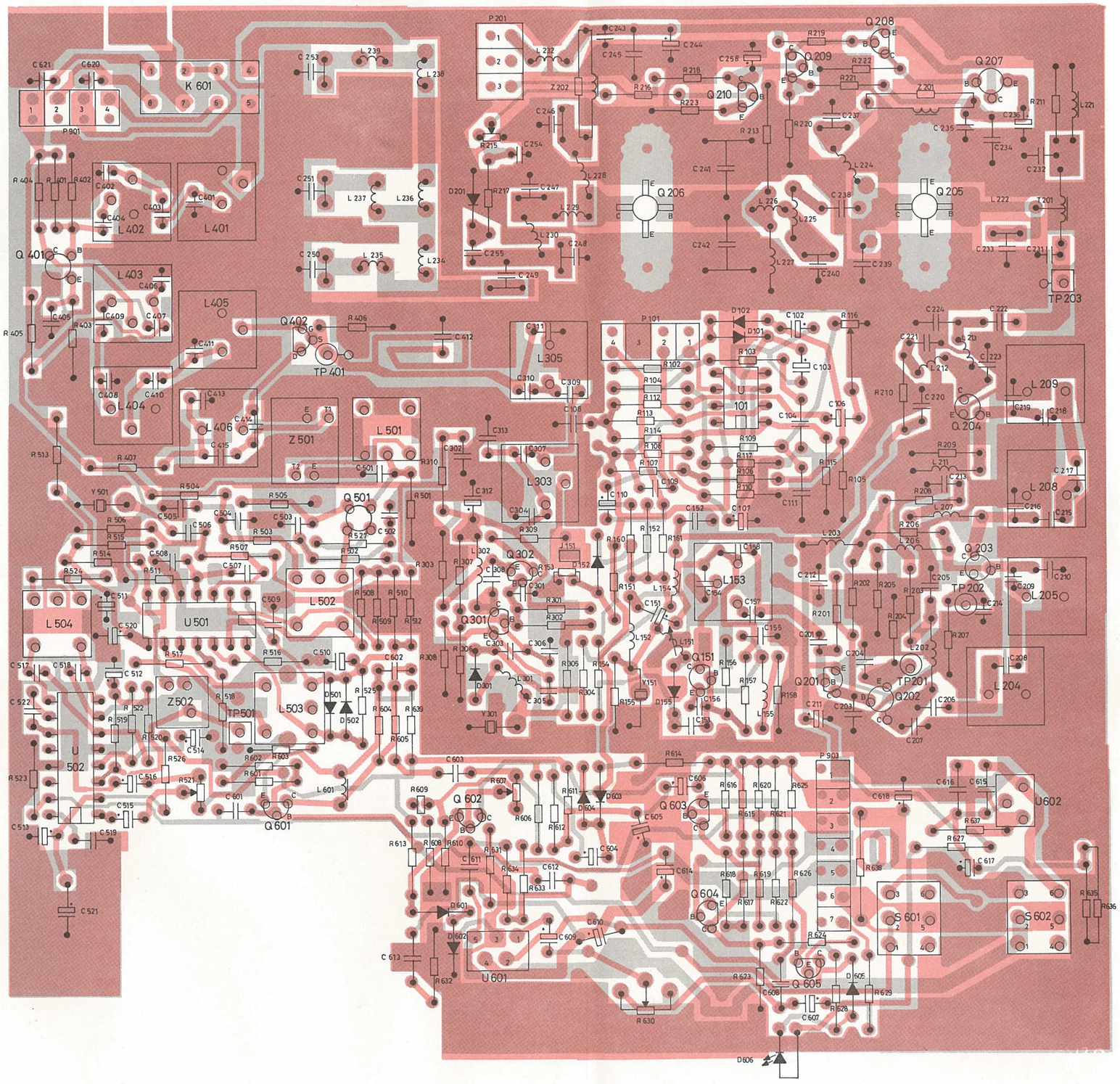
△ = TRANSMITTER CHANNEL

ADJUSTABLE COMPONENTS AND TEST POINTS ON XS 5111 / XS 5112

D402.624

Storno

Storno



RF UNIT RF5110

D402.640

Storno

TYPE	Nº	CODE	DATA			
	C102	73.5172	4.7 uF	20%	Tantal	35V
	C103	73.5172	4.7 uF	20%	Tantal	35V
	C104	76.5142	47 nF	5%	Polyest FL	63V
	C106	73.5170	1.0 uF	20%	Tantal	35 V
	C107	73.5172	4.7 uF	20%	Tantal	35V
	C108	76.5140	6.8 nF	5%	Polyest FL	50 V
	C109	74.5397	1 nF	20%	Ceram DI	50 V
	C110	73.5172	4.7 uF	20%	Tantal	35V
	C111	76.5151	68 nF	5%	Polyest FL	63 V
	C112	74.5392	150 pF	20%	Ceram DI	50 V
	C151	73.5173	10 uF	20%	Tantal	16V
	C152	76.5135	10 nF	10%	Polyest FL	50 V
	C153	74.5386	180 pF	5%	Ceram DI	50 V
	C154	74.5396	680 pF	20%	Ceram DI	50 V
	C155	74.5405	68 pF	5%	Ceram DI	50 V
	C156	74.5403	18 pF	5%	Ceram DI	50 V
	C157	74.5371	10 pF	5%	Ceram DI	50 V
	C158	74.5378	39 pF	5%	Ceram DI	50 V
	C201	74.5371	10 pF	5%	Ceram DI	50 V
	C203	74.5377	33 pF	5%	Ceram DI	50 V
	C204	74.5397	1 nF	20%	Ceram DI	50 V
	C205	74.5397	1 nF	20%	Ceram DI	50 V
	C206	74.5374	18 pF	5%	Ceram DI	50 V
	C207	74.5377	33 pF	5%	Ceram DI	50 V
	C208	79.5003	0.39 pF	5%	Phenolic TB	500V
	C209	74.5373	15 pF	5%	Ceram DI	50 V
	C210	74.5377	33 pF	5%	Ceram DI	50V
	C211	73.5171	2.2 uF	20%	Tantal	35V
	C212	74.5397	1 nF	20%	Ceram DI	50 V
	C213	74.5397	1 nF	20%	Ceram DI	50 V
	C214	74.5395	470 pF	20%	Ceram DI	50 V
	C215	74.5374	18 pF	5%	Ceram DI	50 V
	C216	74.5379	47 pF	5%	Ceram DI	50 V
	C217	79.5005	0.56 pF	5%	Phenolic TB	500 V
	C218	74.5372	12 pF	5%	Ceram DI	50 V
	C219	74.5378	39 pF	5%	Ceram DI	50 V
	C220	74.5397	1 nF	20%	Ceram DI	50 V
	C221	74.5397	1 nF	20%	Ceram DI	50 V
	C222	74.5397	1 nF	20%	Ceram DI	50 V
	C223	74.5374	18 pF	5%	Ceram DI	50V
	C224	74.5374	18 pF	5%	Ceram DI	50V
	C225	74.5397	1 nF	20%	Ceram DI	50 V
	C231	74.5371	10 pF	5%	Ceram DI	50 V
	C232	74.5380	56 pF	5%	Ceram DI	50V
	C233	75.5026	110 pF	5%	Mica	250 V
	C234	76.5144	0.1 uF	10%	Polyest FL	63 V
	C235	74.5392	150 pF	20%	Ceram DI	50 V

Storno

TYPE	Nº	CODE	DATA			
	C236	73.5173	10 uF	20%	Tantal	16V
	C237	75.5028	220 pF	5%	Mica	250 V
10W	C238	74.5030	68 pF	5%	Mica	250V
25W	C238	75.5020	100 pF	5%	Mica	250V
10W	C239	75.5029	5.0 pF	10%	Mica	250V
25W	C239	75.5019	10 pF	5%	Mica	250V
	C240	75.5026	110 pF	5%	Mica	250 V
10W	C241	75.5031	150 pF	5%	Mica	250V
25W	C241	75.5022	240 pF	5%	Mica	250V
10W	C242	75.5031	150 pF	5%	Mica	250V
25W	C242	75.5022	240 pF	5%	Mica	250V
	C243	76.5144	0.1 uF	10%	Polyest FL	63 V
	C244	73.5172	4.7 uF	20%	Tantal	35V
	C245	74.5392	150 pF	20%	Ceram DI	50 V
	C246	75.5028	220 pF	5%	Mica	250 V
25 W	C247	75.5027	130 pF	5%	Mica	250 V
10W	C247	75.5032	82 pF	5%	Mica	250V
	C248	75.5025	30 pF	5%	Teflon	250 V
	C249	75.5028	220 pF	5%	Mica	250 V
	C250	75.5023	8.0 pF	0.5 pF	Teflon	250 V
	C251	75.5024	22 pF	5%	Teflon	250V
	C252	75.5021	29 pF	2%	Teflon	250 V
	C253	75.5023	8.0 pF	0.5 pF	Teflon	250 V
	C254	74.5392	150 pF	20%	Ceram DI	50 V
	C255	74.5361	1.5 pF	0.25 pF	Ceram DI	50 V
	C258	73.5173	10 uF	20%	Tantal	16V
	C301	74.5396	680 pF	20%	Ceram DI	50 V
	C302	76.5135	10 nF	10%	Polyest FL	50 V
	C303	74.5386	180 pF	5%	Ceram DI	50 V
	C304	74.5396	680 pF	20%	Ceram DI	50 V
	C305	74.5405	68 pF	5%	Ceram DI	50 V
	C306	74.5403	18 pF	5%	Ceram DI	50 V
	C307	74.5369	6.8 pF	0.25 pF	Ceram	50 V
	C308	74.5386	180 pF	5%	Ceram DI	50 V
	C309	79.5005	0.56 pF	5%	Phenolic TB	500 V
	C310	74.5373	15 pF	5%	Ceram DI	50V
	C311	74.5379	47 pF	5%	Ceram DI	50 V
	C312	73.5172	4.7 uF	20%	Tantal	35V
	C313	74.5375	150 pF	5%	Ceram DI	50V
	C401	74.5370	8.2 pF	0.25 pF	Ceram DI	50 V
	C402	74.5370	8.2 pF	0.25 pF	Ceram DI	50 V
	C403	79.5006	0.68 pF	5%	Phenolic TB	500 V

RF UNIT RF5110

X402.653

Storno

TYPE	Nº	CODE	DATA		
25 W	L225	62.0985	146-174 MHz	RF coil	
10 W	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	
25 W	L229	62.0979	146-174 MHz	RF coil	
10 W	L229	62.0983	146-174 MHz	RF coil	
25 W	L230	62.0984	146-174 MHz	RF coil	
10 W	L230	62.0986	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	0.7 A
	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	61.5038	10.7 MHz	RF coil	
	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	0.01A
	P101	41.5541		Fem. connector	4 PIN
	P201	41.5545		Fem. connector	3 PIN
	P901	41.5541		Fem. connector	4 PIN
	P903	41.0230		Fem. connector	7 PIN
	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	
25 W	Q206	99.5343		PA Transistor	
10 W	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	

Storno

TYPE	Nº	CODE	DATA			
	Q302	99.5347	PN2369		Transistor	
	Q401	99.5240	BFX89		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	0.125 W
	R103	80.5243	330 ohm	5%	Carbon film	0.125 W
	R104	89.5095	51 Kohm	5%	Carbon film	0.125 W
	R105	89.5083	10.5Kohm	1%	Metal film	0.25W
	R106	89.5085	12.7Kohm	1%	Metal film	0.25W
	R107	89.5083	10.5 kohm	1%	Metal film	0.25 W
	R108	89.5082	5.11 Kohm	1%	Metal film	0.25 W
	R109	89.5091	1.3 Kohm	5%	Carbon film	0.125 W
	R110	89.5082	5.11 Kohm	1%	Metal film	0.25 W
	R112	89.5086	20 Kohm	1%	Metal film	0.25 W
	R113	89.5084	12.4 kohm	1%	Metal film	0.25 W
	R114	89.5087	32.4 Kohm	1%	Metal Film	0.25 W
	R115	80.5249	1.0 Kohm	5%	Carbon film	0.125W
	R116	86.5050	5 Kohm	20%	Carbon pot.	0.1 W
	R117	80.5254	2.7 Kohm	5%	Carbon film	0.125 W
	R151	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R152	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R153	89.5088	3.3 Kohm	10%	NTC	0.5 W
	R154	80.5269	47 Kohm	5%	Carbon film	0.125 W
	R155	80.5247	680 ohm	5%	Carbon film	0.125 W
	R156	80.5260	8.2 Kohm	5%	Carbon film	0.125 W
	R157	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R158	80.5242	270 ohm	5%	Carbon film	0.125 W
	R160	80.5263	15 Kohm	5%	Carbon film	0.125 W
	R161	80.5257	4.7 Kohm	5%	Carbon film	0.125 W
	R201	80.5255	3.3 Kohm	5%	Carbon film	0.125 W
	R202	80.5244	390 ohm	5%	Carbon film	0.125 W
	R203	80.5233	47 ohm	5%	Carbon film	0.125 W
	R204	80.5229	22 ohm	5%	Carbon film	0.125 W
	R205	80.5241	220 ohm	5%	Carbon film	0.125 W
	R206	89.5092	2.4 Kohm	5%	Carbon film	0.125 W
	R207	80.5225	10 ohm	5%	Carbon film	0.125 W
	R208	80.5230	27 ohm	5%	Carbon film	0.125 W

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Storno

TYPE	Nº	CODE	DATA			
	R634	80.5213	1 ohm	5%	Carbon film	0.125 W
	R635	80.5234	56 ohm	5%	Carbon film	0.125W
	R636	80.52XX	6.8-270 ohm	5%	Carbon film	0.125W
	R637	80.5247	680 ohm	5%	Carbon film	0.125 W
	R638	80.5413	1 ohm	5%	Carbon film	0.25 W
	R639	80.5237	100 ohm	5%	Carbon film	0.125 W
	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	98-12
	Z201	61.1384			Damping choke	
	Z202	61.1384			Damping choke	
5112	Z501	69.5037	10.7 MHz		Crystal filter	25/30 kHz
5113	Z501	69.5038	10.7 MHz		Crystal filter	20 kHz
5114	Z501	69.5039	10.7 MHz		Crystal filter	12.5 kHz
	Z502	69.5045	455 kHz		Ceram. filter	20/25/30 kHz
5114	Z502	69.5046	455 kHz		Ceram. filter	12.5 kHz

Storno

TYPE	Nº	CODE	DATA

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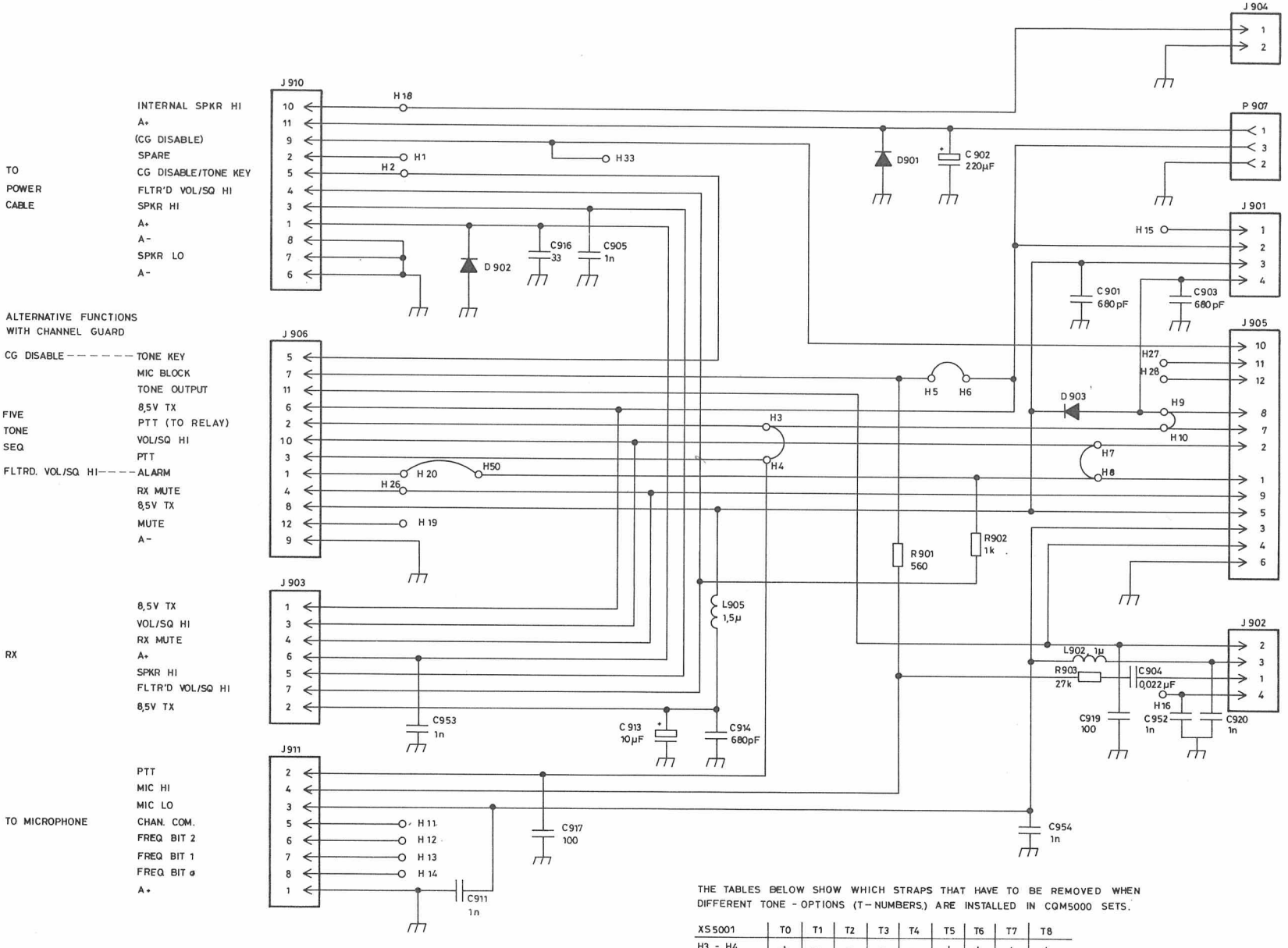
Storno

Storno



THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (T - NUMBERS.) ARE INSTALLED IN CQM5000 SETS.

XS 5001	T0	T1	T2	T3	T4	T5	T6	T7	T8
H3 - H4	+	-	-	-	-	+	+	+	+
H5 - H6	+	-	-	-	-	+	+	+	+
H7 - H8	+	+	+	+	+	-	-	+	-
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	-	-	-	-	+	+	+	+

INTERCONNECT UNIT XS 5001

Storno

TYPE	Nº	CODE	DATA			
	C102	73.5172	4.7 uF	20%	Tantal	35V
	C103	73.5172	4.7 uF	20%	Tantal	35V
	C104	76.5142	47 nF	5%	Polyest FL	63V
	C106	73.5170	1.0 uF	20%	Tantal	35 V
	C107	73.5172	4.7 uF	20%	Tantal	35V
	C108	76.5140	6.8 nF	5%	Polyest FL	50 V
	C109	74.5397	1 nF	20%	Ceram DI	50 V
	C110	73.5172	4.7 uF	20%	Tantal	35V
	C111	76.5151	68 nF	5%	Polyest FL	63 V
	C112	74.5392	150 pF	20%	Ceram DI	50 V
	C151	73.5173	10 uF	20%	Tantal	16V
	C152	76.5135	10 nF	10%	Polyest FL	50 V
	C153	74.5386	180 pF	5%	Ceram DI	50 V
	C154	74.5396	680 pF	20%	Ceram DI	50 V
	C155	74.5405	68 pF	5%	Ceram DI	50 V
	C156	74.5403	18 pF	5%	Ceram DI	50 V
	C157	74.5371	10 pF	5%	Ceram DI	50 V
	C158	74.5378	39 pF	5%	Ceram DI	50 V
	C201	74.5371	10 pF	5%	Ceram DI	50 V
	C203	74.5377	33 pF	5%	Ceram DI	50 V
	C204	74.5397	1 nF	20%	Ceram DI	50 V
	C205	74.5397	1 nF	20%	Ceram DI	50 V
	C206	74.5374	18 pF	5%	Ceram DI	50 V
	C207	74.5377	33 pF	5%	Ceram DI	50 V
	C208	79.5003	0.39 pF	5%	Phenolic TB	500V
	C209	74.5373	15 pF	5%	Ceram DI	50 V
	C210	74.5377	33 pF	5%	Ceram DI	50V
	C211	73.5171	2.2 uF	20%	Tantal	35V
	C212	74.5397	1 nF	20%	Ceram DI	50 V
	C213	74.5397	1 nF	20%	Ceram DI	50 V
	C214	74.5395	470 pF	20%	Ceram DI	50 V
	C215	74.5374	18 pF	5%	Ceram DI	50 V
	C216	74.5379	47 pF	5%	Ceram DI	50 V
	C217	79.5005	0.56 pF	5%	Phenolic TB	500 V
	C218	74.5372	12 pF	5%	Ceram DI	50 V
	C219	74.5378	39 pF	5%	Ceram DI	50 V
	C220	74.5397	1 nF	20%	Ceram DI	50 V
	C221	74.5397	1 nF	20%	Ceram DI	50 V
	C222	74.5397	1 nF	20%	Ceram DI	50 V
	C223	74.5374	18 pF	5%	Ceram DI	50V
	C224	74.5374	18 pF	5%	Ceram DI	50V
	C225	74.5397	1 nF	20%	Ceram DI	50 V
	C231	74.5371	10 pF	5%	Ceram DI	50 V
	C232	74.5380	56 pF	5%	Ceram DI	50V
	C233	75.5026	110 pF	5%	Mica	250 V
	C234	76.5144	0.1 uF	10%	Polyest FL	63 V
	C235	74.5392	150 pF	20%	Ceram DI	50 V

Storno

TYPE	Nº	CODE	DATA			
	C236	73.5173	10 uF	20%	Tantal	16V
	C237	75.5028	220 pF	5%	Mica	250 V
10W	C238	74.5030	68 pF	5%	Mica	250V
25W	C238	75.5020	100 pF	5%	Mica	250V
10W	C239	75.5029	5.0 pF	10%	Mica	250V
25W	C239	75.5019	10 pF	5%	Mica	250V
	C240	75.5026	110 pF	5%	Mica	250 V
10W	C241	75.5031	150 pF	5%	Mica	250V
25W	C241	75.5022	240 pF	5%	Mica	250V
10W	C242	75.5031	150 pF	5%	Mica	250V
25W	C242	75.5022	240 pF	5%	Mica	250V
	C243	76.5144	0.1 uF	10%	Polyest FL	63 V
	C244	73.5172	4.7 uF	20%	Tantal	35V
	C245	74.5392	150 pF	20%	Ceram DI	50 V
	C246	75.5028	220 pF	5%	Mica	250 V
25 W	C247	75.5027	130 pF	5%	Mica	250 V
10W	C247	75.5032	82 pF	5%	Mica	250V
	C248	75.5025	30 pF	5%	Teflon	250 V
	C249	75.5028	220 pF	5%	Mica	250 V
	C250	75.5023	8.0 pF	0.5 pF	Teflon	250 V
	C251	75.5024	22 pF	5%	Teflon	250V
	C252	75.5021	29 pF	2%	Teflon	250 V
	C253	75.5023	8.0 pF	0.5 pF	Teflon	250 V
	C254	74.5392	150 pF	20%	Ceram DI	50 V
	C255	74.5361	1.5 pF	0.25 pF	Ceram DI	50 V
	C258	73.5173	10 uF	20%	Tantal	16V
	C301	74.5396	680 pF	20%	Ceram DI	50 V
	C302	76.5135	10 nF	10%	Polyest FL	50 V
	C303	74.5386	180 pF	5%	Ceram DI	50 V
	C304	74.5396	680 pF	20%	Ceram DI	50 V
	C305	74.5405	68 pF	5%	Ceram DI	50 V
	C306	74.5403	18 pF	5%	Ceram DI	50 V
	C307	74.5369	6.8 pF	0.25 pF	Ceram	50 V
	C308	74.5386	180 pF	5%	Ceram DI	50 V
	C309	79.5005	0.56 pF	5%	Phenolic TB	500 V
	C310	74.5373	15 pF	5%	Ceram DI	50V
	C311	74.5379	47 pF	5%	Ceram DI	50 V
	C312	73.5172	4.7 uF	20%	Tantal	35V
	C313	74.5375	150 pF	5%	Ceram DI	50V
	C401	74.5370	8.2 pF	0.25 pF	Ceram DI	50 V
	C402	74.5370	8.2 pF	0.25 pF	Ceram DI	50 V
	C403	79.5006	0.68 pF	5%	Phenolic TB	500 V

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TYPE	Nº	CODE	DATA		
	C404	74.5395	470 pF 20%	Ceram DI	50V
	C405	74.5395	470 pF 20%	Ceram DI	50 V
	C406	74.5395	470 pF 20%	Ceram DI	50 V
	C407	74.5370	8.2 pF 0.25 pF	Ceram DI	50 V
	C408	74.5370	8.2 pF 0.25 pF	Ceram DI	50 V
	C409	79.5001	0.22 pF 5%	Phenolic TB	500 V
	C410	74.5361	1.5 pF 0.25 pF	Ceram DI	50 V
	C411	74.5368	5.6 pF 0.25 pF	Ceram	50 V
	C412	76.5132	3.3 nF 10%	Polyest FL	50 V
	C413	76.5135	10 nF 10%	Polyest FL	50 V
	C414	76.5131	2.2 nF 10%	Polyest FL	50V
	C415	74.5388	270 pF 5%	Ceram DI	50 V
	C501	74.5375	22 pF 5%	Ceram DI	50 V
	C502	74.5395	470 pF 20%	Ceram DI	50 V
	C503	76.5135	10 nF 10%	Polyest FL	50 V
	C504	76.5135	10 nF 10%	Polyest FL	50 V
	C505	76.5135	10 nF 10%	Polyest FL	50 V
	C506	74.5379	47 pF 5%	Ceram DI	50 V
	C507	74.5383	100 pF 5%	Ceramic DI	50V
	C508	74.5387	220 pF 5%	Ceram DI	50 V
	C509	76.5133	4.7 nF 10%	Polyest FL	50 V
	C510	73.5170	1.0 uF 20%	Tantal	35 V
A7000382	C511	73.5168	0.22 uF 20%	Tantal	35 V
	C512	73.5170	1.0 uF 20%	Tantal	35 V
	C513	73.5170	1.0 uF 20%	Tantal	35 V
	C514	73.5170	1.0 uF 20%	Tantal	35 V
	C515	73.5168	0.22 uF 20%	Tantal	35 V
	C516	73.5168	0.22 uF 20%	Tantal	35 V
	C517	74.5393	220 pF 20%	Ceram DI	50V
	C518	74.5393	220 pF 20%	Ceram DI	50V
	C519	74.5397	1 nF 20%	Ceram DI	50 V
	C520	73.5170	1.0 uF 20%	Tantal	35 V
	C521	73.5166	470 uF -10+100%	Elco	16V
	C522	76.5132	3.3 nF 10%	Polyest FL	50 V
	C601	76.5133	4.7 nF 10%	Polyest FL	50 V
	C602	76.5134	6.8 nF 10%	Polyest FL	50 V
	C603	76.5139	47 nF 10%	Polyest FL	50 V
	C604	73.5172	4.7 uF 20%	Tantal	35V
	C605	73.5164	47 uF -10+100%	Elco	16V
	C606	73.5170	1.0 uF 20%	Tantal	35 V
	C607	73.5169	0.47 uF 20%	Tantal	35 V
	C608	76.5144	0.1 uF 10%	Polyest FL	63 V
	C609	73.5172	4.7 uF 20%	Tantal	35V
	C610	73.5175	47 uF 20%	Tantal	6.3V
	C611	76.5144	0.1 uF 10%	Polyest FL	63 V
	C612	73.5168	0.22 uF 20%	Tantal	35 V
	C613	76.5148	0.47 uF 10%	Polyest FL	63V
	C614	73.5166	470 uF -10+100%	Elco	16V

TYPE	Nº	CODE	DATA		
	C615	76.5143	68 nF 10%	Polyest FL	63V
	C616	76.5143	68 nF 10%	Polyest FL	63V
	C617	73.5164	47 uF -10+100%	Elco	16V
	C618	73.5165	220 uF -10+100%	Elco	25V
	C620	74.5395	470 pF 20%	Ceram DI	50 V
	C621	74.5395	470 pF 20%	Ceram DI	50 V
	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	1.6 V	LED	20 mA
	J151	41.5529		Socket	
	J301	41.5529		Socket	
	J601	41.5165		UHF connector	
	K601	58.5085	21-21	Relay	12V
	L151	61.5032	48-58 MHz	RF coil	
	L152	61.5030	1.5 uH 10%	RF choke	0.8 A
	L153	61.5041	146-174 MHz	RF coil	
	L154	61.5031	10 uH 10%	RF choke	0.3 A
	L155	61.5030	1.5 uH 10%	RF choke	0.8 A
	L202	61.5028	0.1 uH 10%	RF choke	1.3 A
	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	0.65 A
	L207	61.5028	0.1 uH 10%	RF choke	1.3 A
	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	0.65 A
	L212	62.0982	146-174 MHz	RF coil	
	L213	62.0982	146-174 MHz	RF coil	
	L221	61.5031	10 uH 10%	RF choke	0.3 A
	L224	62.0987	146-174 MHz	RF coil	

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TYPE	Nº	CODE	DATA		
25 W	L225	62.0985	146-174 MHz	RF coil	
10 W	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	
25 W	L229	62.0979	146-174 MHz	RF coil	
10 W	L229	62.0983	146-174 MHz	RF coil	
25 W	L230	62.0984	146-174 MHz	RF coil	
10 W	L230	62.0986	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	0.7 A
	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	61.5038	10.7 MHz	RF coil	
	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	0.01A
	P101	41.5541		Fem. connector	4 PIN
	P201	41.5545		Fem. connector	3 PIN
	P901	41.5541		Fem. connector	4 PIN
	P903	41.0230		Fem. connector	7 PIN
	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	
25 W	Q206	99.5343		PA Transistor	
10 W	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	

Storno

TYPE	Nº	CODE	DATA			
	Q302	99.5347	PN2369		Transistor	
	Q401	99.5240	BFX89		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	0.125 W
	R103	80.5243	330 ohm	5%	Carbon film	0.125 W
	R104	89.5095	51 Kohm	5%	Carbon film	0.125 W
	R105	89.5083	10.5Kohm	1%	Metal film	0.25W
	R106	89.5085	12.7Kohm	1%	Metal film	0.25W
	R107	89.5083	10.5 kohm	1%	Metal film	0.25 W
	R108	89.5082	5.11 Kohm	1%	Metal film	0.25 W
	R109	89.5091	1.3 Kohm	5%	Carbon film	0.125 W
	R110	89.5082	5.11 Kohm	1%	Metal film	0.25 W
	R112	89.5086	20 Kohm	1%	Metal film	0.25 W
	R113	89.5084	12.4 kohm	1%	Metal film	0.25 W
	R114	89.5087	32.4 Kohm	1%	Metal Film	0.25 W
	R115	80.5249	1.0 Kohm	5%	Carbon film	0.125W
	R116	86.5050	5 Kohm	20%	Carbon pot.	0.1 W
	R117	80.5254	2.7 Kohm	5%	Carbon film	0.125 W
	R151	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R152	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R153	89.5088	3.3 Kohm	10%	NTC	0.5 W
	R154	80.5269	47 Kohm	5%	Carbon film	0.125 W
	R155	80.5247	680 ohm	5%	Carbon film	0.125 W
	R156	80.5260	8.2 Kohm	5%	Carbon film	0.125 W
	R157	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R158	80.5242	270 ohm	5%	Carbon film	0.125 W
	R160	80.5263	15 Kohm	5%	Carbon film	0.125 W
	R161	80.5257	4.7 Kohm	5%	Carbon film	0.125 W
	R201	80.5255	3.3 Kohm	5%	Carbon film	0.125 W
	R202	80.5244	390 ohm	5%	Carbon film	0.125 W
	R203	80.5233	47 ohm	5%	Carbon film	0.125 W
	R204	80.5229	22 ohm	5%	Carbon film	0.125 W
	R205	80.5241	220 ohm	5%	Carbon film	0.125 W
	R206	89.5092	2.4 Kohm	5%	Carbon film	0.125 W
	R207	80.5225	10 ohm	5%	Carbon film	0.125 W
	R208	80.5230	27 ohm	5%	Carbon film	0.125 W

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TYPE	Nº	CODE	DATA			
	R209	80.5237	100 ohm	5%	Carbon film	0.125 W
	R210	80.5230	27 ohm	5%	Carbon film	0.125 W
	R211	89.5090	51 ohm	5%	Carbon comp.	0.5 W
	R213	89.5089	10 ohm	5%	Carbon comp.	0.5 W
	R215	86.5078	5 Kohm	10%	Cerm. pot.	0.5 W
	R216	80.5253	2.2 Kohm	5%	Carbon film	0.125 W
	R217	80.5257	4.7 Kohm	5%	Carbon film	0.125 W
	R218	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R219	80.5252	1.8 Kohm	5%	Carbon film	0.125 W
	R220	80.5241	220 ohm	5%	Carbon film	0.125 W
	R221	80.5245	470 ohm	5%	Carbon film	0.125 W
	R222	80.5246	560 ohm	5%	Carbon film	0.125 W
	R223	80.5249	1 Kohm	5%	Carbon film	0.125 W
	R301	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R302	80.5255	3.3 Kohm	5%	Carbon film	0.125 W
	R303	80.5242	270 ohm	5%	Carbon film	0.125 W
	R304	80.5269	47 Kohm	5%	Carbon film	0.125 W
	R305	80.5247	680 ohm	5%	Carbon film	0.125 W
	R306	80.5260	8.2 Kohm	5%	Carbon film	0.125 W
	R307	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R308	80.5242	270 ohm	5%	Carbon film	0.125 W
	R309	80.5229	22 ohm	5%	Carbon film	0.125 W
	R310	80.5225	10 ohm	5%	Carbon film	0.125 W
	R401	80.5257	4.7 Kohm	5%	Carbon film	0.125 W
	R402	80.5251	1.5 Kohm	5%	Carbon film	0.125 W
	R403	80.5237	100 ohm	5%	Carbon film	0.125 W
	R404	80.5245	470 ohm	5%	Carbon film	0.125 W
	R405	80.5233	47 ohm	5%	Carbon film	0.125 W
	R406	80.5252	1.8 Kohm	5%	Carbon film	0.125 W
	R407	80.5237	100 ohm	5%	Carbon film	0.125 W
	R501	80.5249	1 Kohm	5%	Carbon film	0.125 W
	R502	80.5266	27 Kohm	5%	Carbon film	0.125 W
	R503	80.5266	27 Kohm	5%	Carbon film	0.125 W
	R504	80.5243	330 ohm	5%	Carbon film	0.125 W
	R505	80.5242	270 ohm	5%	Carbon film	0.125 W
	R506	80.5260	8.2 Kohm	5%	Carbon film	0.125 W
	R507	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R508	80.5253	2.2 Kohm	5%	Carbon filter	0.125 W
	R509	80.5253	2.2 Kohm	5%	Carbon film	0.125 W
	R510	80.5262	12 Kohm	5%	Carbon film	0.125 W
	R511	80.5247	680 ohm	5%	Carbon film	0.125 W
	R512	80.5243	330 ohm	5%	Carbon film	0.125 W
	R513	80.5243	330 ohm	5%	Carbon film	0.125 W
	R514	80.5252	1.8 Kohm	5%	Carbon film	0.125 W
	R515	80.5262	12 Kohm	5%	Carbon film	0.125 W
	R516	80.5247	680 ohm	5%	Carbon film	0.125 W
	R517	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R518	80.5260	8.2 Kohm	5%	Carbon film	0.125 W

TYPE	Nº	CODE	DATA			
	R519	80.5252	1.8 Kohm	5%	Carbon film	0.125 W
	R520	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R521	86.5060	25 Kohm	20%	Carbon pot.	0.1W
	R522	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R523	80.5255	3.3 Kohm	5%	Carbon film	0.125 W
	R524	80.5268	39 Kohm	5%	Carbon film	0.125W
	R525	80.5268	39 Kohm	5%	Carbon film	0.125 W
	R526	80.5221	4.7 ohm	5%	Carbon film	0.125 W
	R527	80.5237	100 ohm	5%	Carbon film	0.125 W
	R601	80.5269	47 Kohm	5%	Carbon film	0.125 W
	R602	80.5265	22 Kohm	5%	Carbon film	0.125 W
	R603	80.5243	330 ohm	5%	Carbon film	0.125 W
	R604	80.5264	18 Kohm	5%	Carbon film	0.125 W
	R605	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R606	80.5278	270 Kohm	5%	Carbon film	0.125 W
	R607	86.5080	10 Kohm	20%	Carbon pot.	0.1W
	R608	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R609	89.5053	470 ohm	20%	NTC	0.6 W
	R610	80.5260	8.2 Kohm	5%	Carbon film	0.125 W
	R611	80.5238	120 ohm	5%	Carbon film	0.125 W
	R612	80.5245	470 ohm	5%	Carbon film	0.125 W
	R613	80.5248	820 ohm	5%	Carbon film	0.125 W
	R614	80.5256	3.9 Kohm	5%	Carbon film	0.125 W
	R615	80.5269	47 Kohm	5%	Carbon film	0.125 W
	R616	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R617	80.5280	390 Kohm	5%	Carbon film	0.125 W
	R618	80.5262	12 Kohm	5%	Carbon film	0.125 W
	R619	80.5266	27 Kohm	5%	Carbon film	0.125 W
	R620	80.5266	27 Kohm	5%	Carbon film	0.125 W
	R621	80.5252	1.8 Kohm	5%	Carbon film	0.125 W
	R622	80.5243	330 ohm	5%	Carbon film	0.125 W
	R623	80.5259	6.8 Kohm	5%	Carbon film	0.125 W
	R624	80.5261	10 Kohm	5%	Carbon film	0.125 W
	R625	80.5255	3.3 Kohm	5%	Carbon film	0.125 W
	R626	80.5249	1 Kohm	5%	Carbon film	0.125 W
	R627	80.5241	220 ohm	5%	Carbon film	0.125 W
	R628	80.5237	100 ohm	5%	Carbon film	0.125 W
	R629	80.5260	8.2 Kohm	5%	Carbon film	0.125W
	R630	86.5077	47 Kohm	20%	Carbon pot.	0.15 W
	R631	80.5229	22 ohm	5%	Carbon film	0.125 W
	R632	80.5213	1 ohm	5%	Carbon film	0.125 W
	R633	80.5238	120 ohm	5%	Carbon film	0.125 W

RF UNIT RF5110

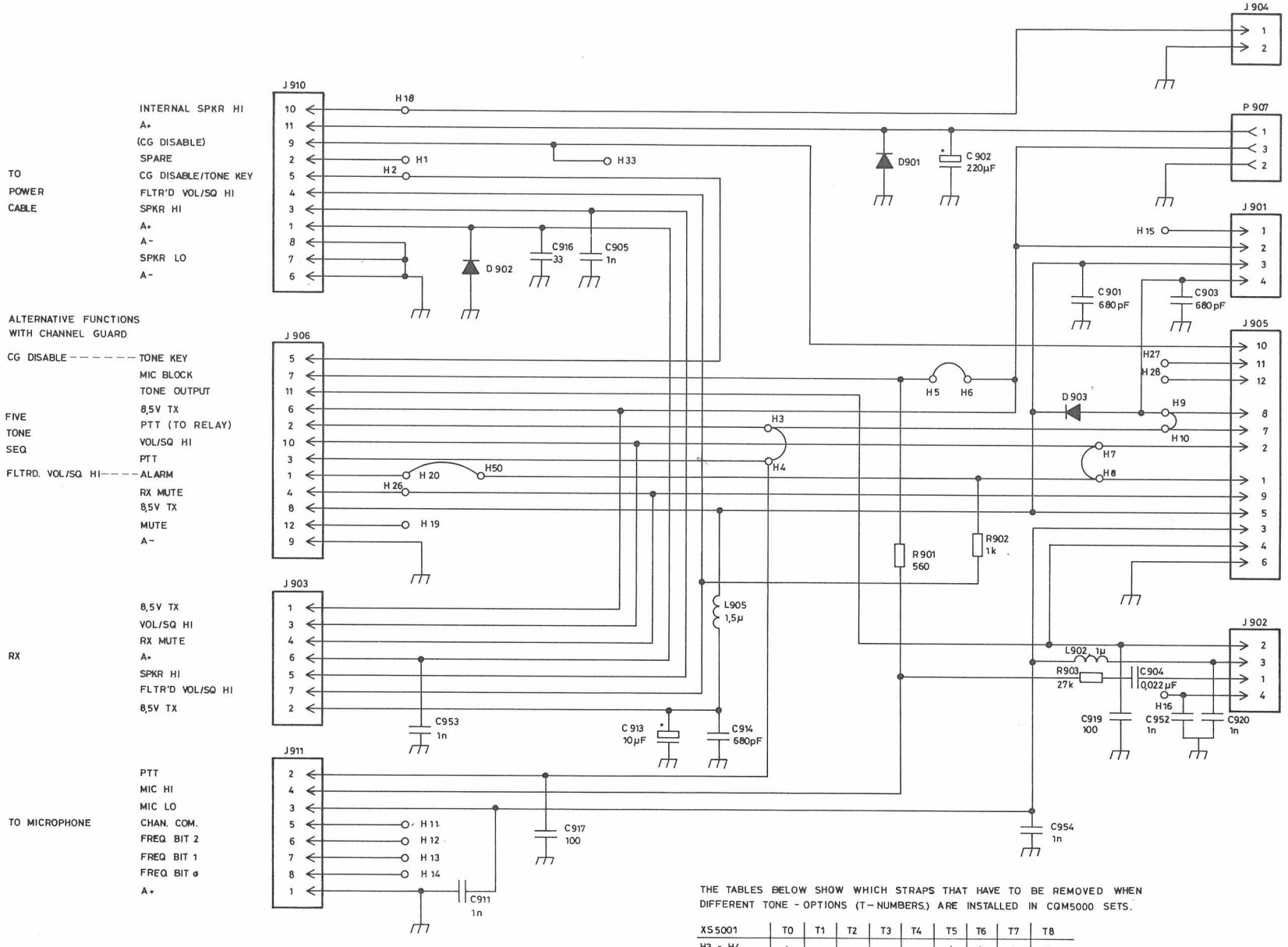
TYPE	Nº	CODE	DATA			
	R634	80.5213	1 ohm	5%	Carbon film	0.125 W
	R635	80.5234	56 ohm	5%	Carbon film	0.125W
	R636	80.52XX	6.8-270 ohm	5%	Carbon film	0.125W
	R637	80.5247	680 ohm	5%	Carbon film	0.125 W
	R638	80.5413	1 ohm	5%	Carbon film	0.25 W
	R639	80.5237	100 ohm	5%	Carbon film	0.125 W
	S601	47.0641			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	98-12
	Z201	61.1384			Damping choke	
	Z202	61.1384			Damping choke	
5112	Z501	69.5037	10.7 MHz		Crystal filter	25/30 kHz
5113	Z501	69.5038	10.7 MHz		Crystal filter	20 kHz
5114	Z501	69.5039	10.7 MHz		Crystal filter	12.5 kHz
	Z502	69.5045	455 kHz		Ceram. filter	20/25/30 kHz
5114	Z502	69.5046	455 kHz		Ceram. filter	12.5 kHz

Storno

TYPE	Nº	CODE	DATA

RF UNIT RF5110

Storno



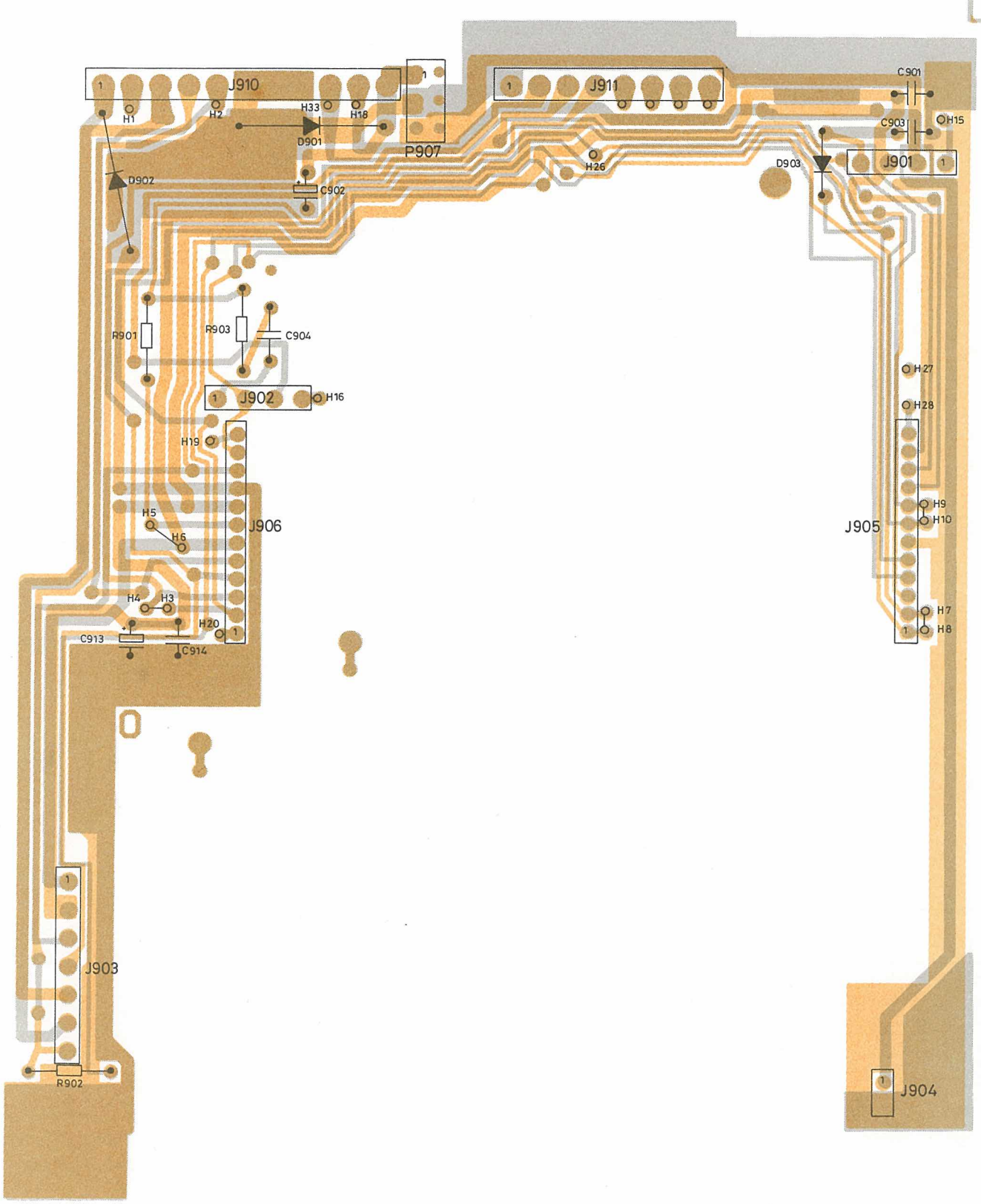
THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (T-NUMBERS) ARE INSTALLED IN CQM5000 SETS.

XS5001	T0	T1	T2	T3	T4	T5	T6	T7	T8
H3 - H4	+	-	-	-	-	+	+	+	+
H5 - H6	+	-	-	-	-	+	+	+	+
H7 - H8	+	+	+	+	+	-	-	+	-
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	-	-	-	-	+	+	+	+

INTERCONNECT UNIT
XS 5001

R402-015

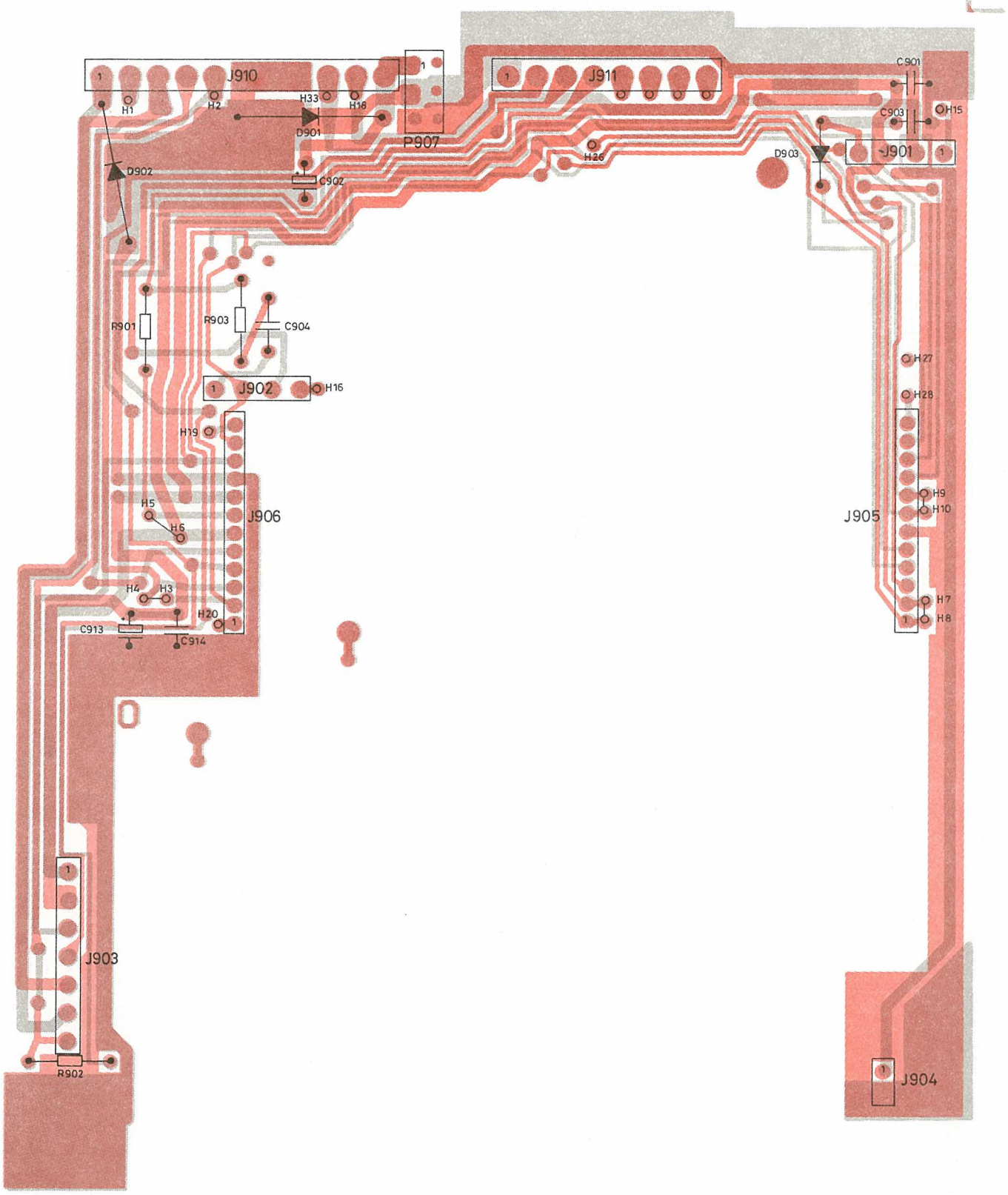
Storno



INTERCONNECT UNIT
XS 5001

D402.637

Storno



INTERCONNECT UNIT
XS 5001

D402.637

Storno

TYPE	Nº	CODE	DATA	
	C901	74.5396	680pF 20% Ceram DI	50V
	C902	73.5165	220uF -10/+100% Elco	25V
	C903	74.5396	680pF 20% Ceram DI	50V
	C904	74.5141	22nF 5% Polyest FL	50V
	C905	74.5397	1 nF 20% Ceram	50V
	C911	74.5397	1 nF 20% Ceram	50V
	C913	73.5173	10 uF 20% Tantal	25V
	C914	74.5396	680 pF 20% Ceram	50V
	C916	76.5141	22 nF 20% Polyest. Fl.	50V
	C917	74.5391	100 pF 20% Ceram	50V
	C919	74.5391	100 pF 20% Ceram	50V
	C920	74.5397	1 nF 20% Ceram	50V
	C952	74.5397	1 nF 20% Ceram	50V
	C953	74.5397	1 nF 20% Ceram	50V
	C954	74.5397	1 nF 20% Ceram	50V
	D901	99.5520	1N5401 Diode	
	D902	99.5220	1N5401 Diode	
	D903	99.5237	1N4148 Diode	
	J901	41.0228	Male connector	4 pin
	J902	41.0228	Male connector	4 pin
	J903	41.0229	Male connector	4 pin
	J904	41.0225	Male connector	2 pin
	J905	41.0227	Male connector	12 pin
	J906	41.0227	Male connector	12 pin
	J907	41.5544	Fem. connector	3 pin
	J910	41.0232	Male connector	11 pin
	L902	61.5029	1.0 uH 10% RF choke	0.65 A
	L905	61.5030	1.5 uH 10% RF choke	0.8 A
	R901	80.5246	560 ohm 5% Carbon film	0.125W
	R902	80.5249	1 Kohm 5% Carbon film	0.125W
	R903	80.5265	27 Kohm 5% Carbon film	0.125W

Storno

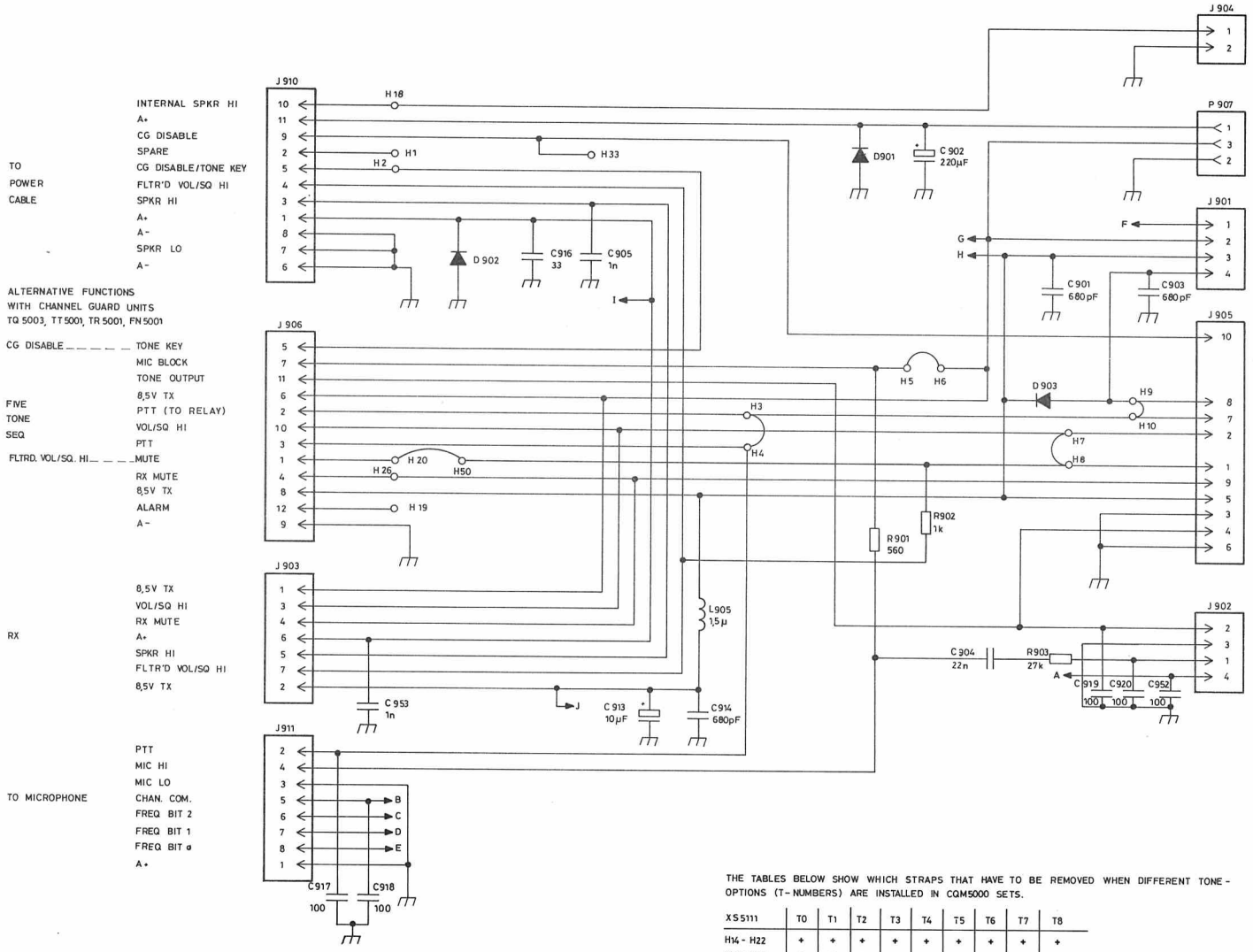
TYPE	Nº	CODE	DATA

INTERCONNECT UNIT XS5001

X402.648

Storno

Storno



THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE-OPTIONS (T-NUMBERS) ARE INSTALLED IN CQM5000 SETS.

XS 5111	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H32 - H29	+	+	+	+	+	+	+	+	+
H31 - H30	+	+	+	+	+	+	+	+	+
H3 - H4	+	–	–	–	–	+	+	+	+
H5 - H6	+	–	–	–	–	+	+	+	+
H7 - H8	+	+	+	+	+	–	–	+	–
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	–	–	–	–	+	+	+	+

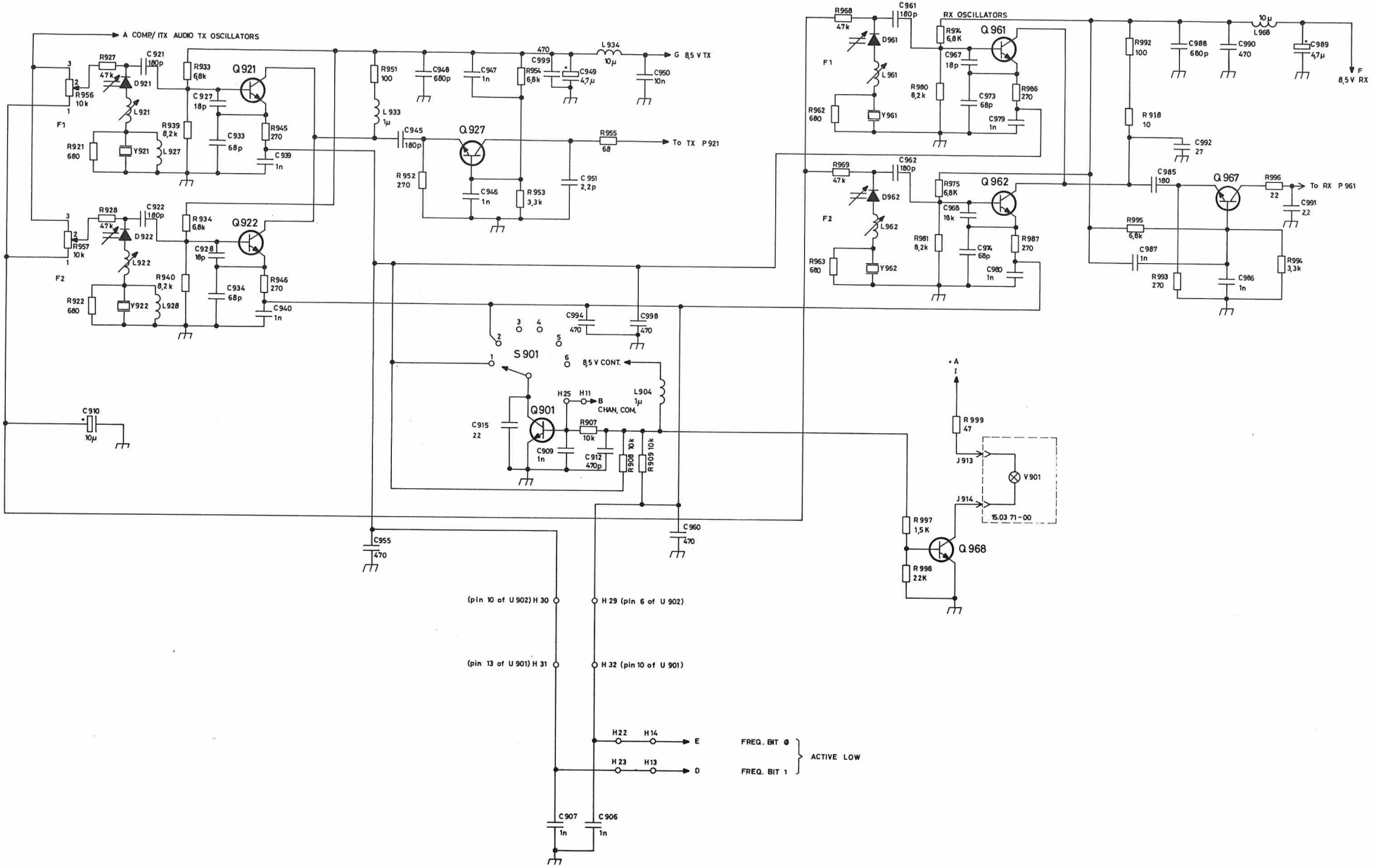
CHANNEL SELECTOR UNIT

XS 5111

D402.635

Storno

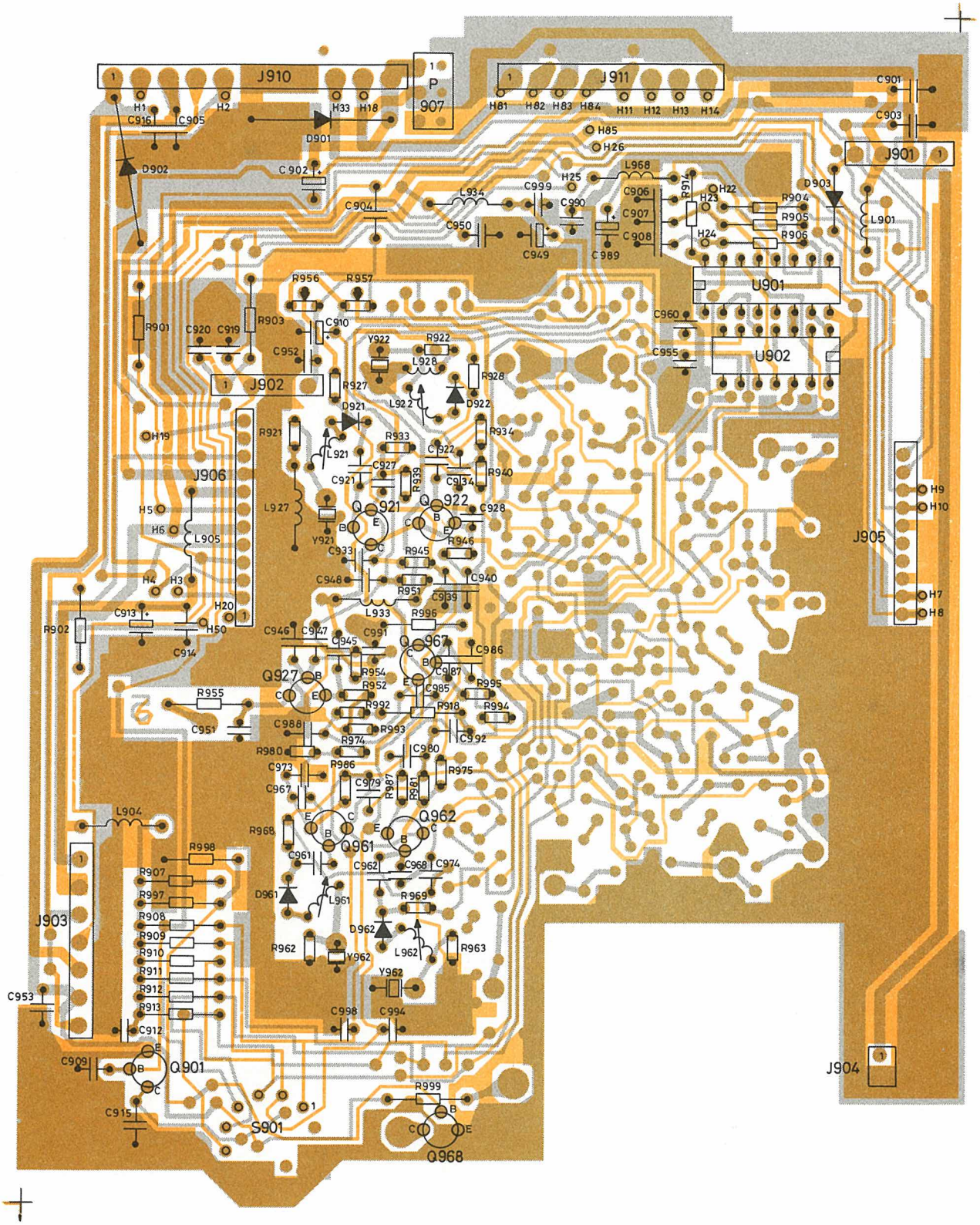
Storno



CHANNEL SELECTOR UNIT XS 5111
OSCILLATOR SECTION

D402.616

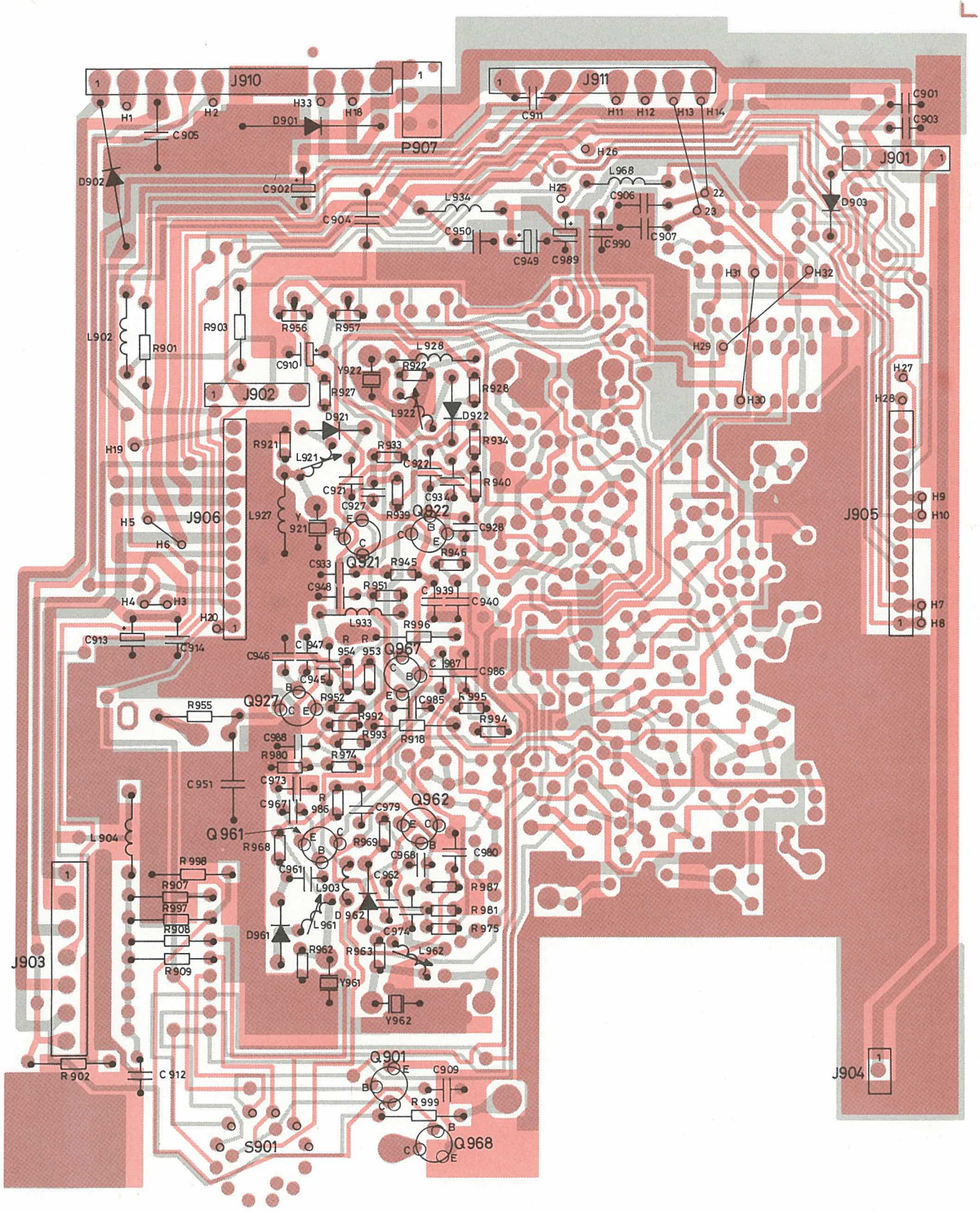
Storno



CHANNEL SELECTOR UNIT XS 5111
INTERCONNECTION SECTION

D402.617/3

Storno

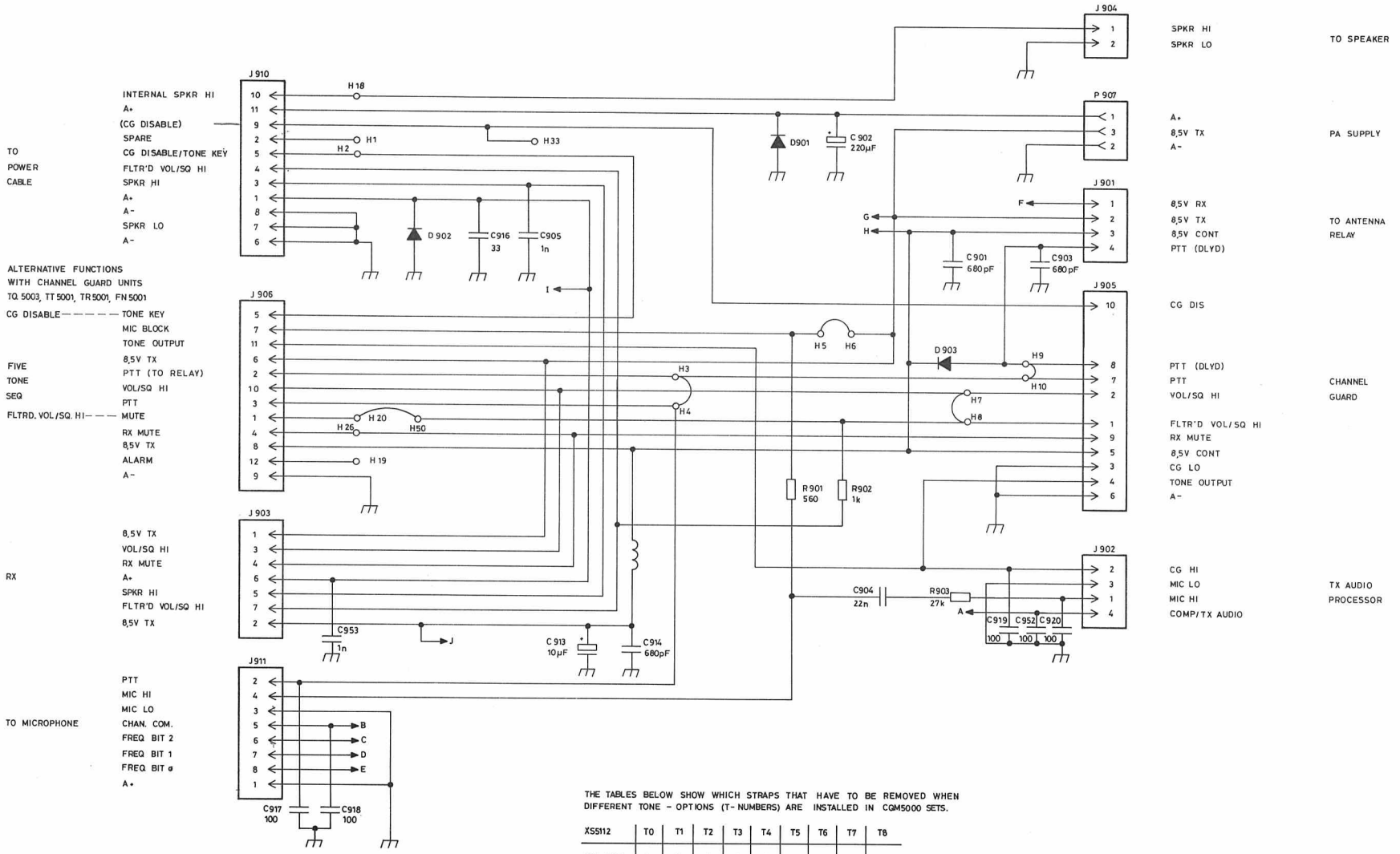


CHANNEL SELECTOR UNIT XS 5111
INTERCONNECTION SECTION

D402.617

Storno

Storno



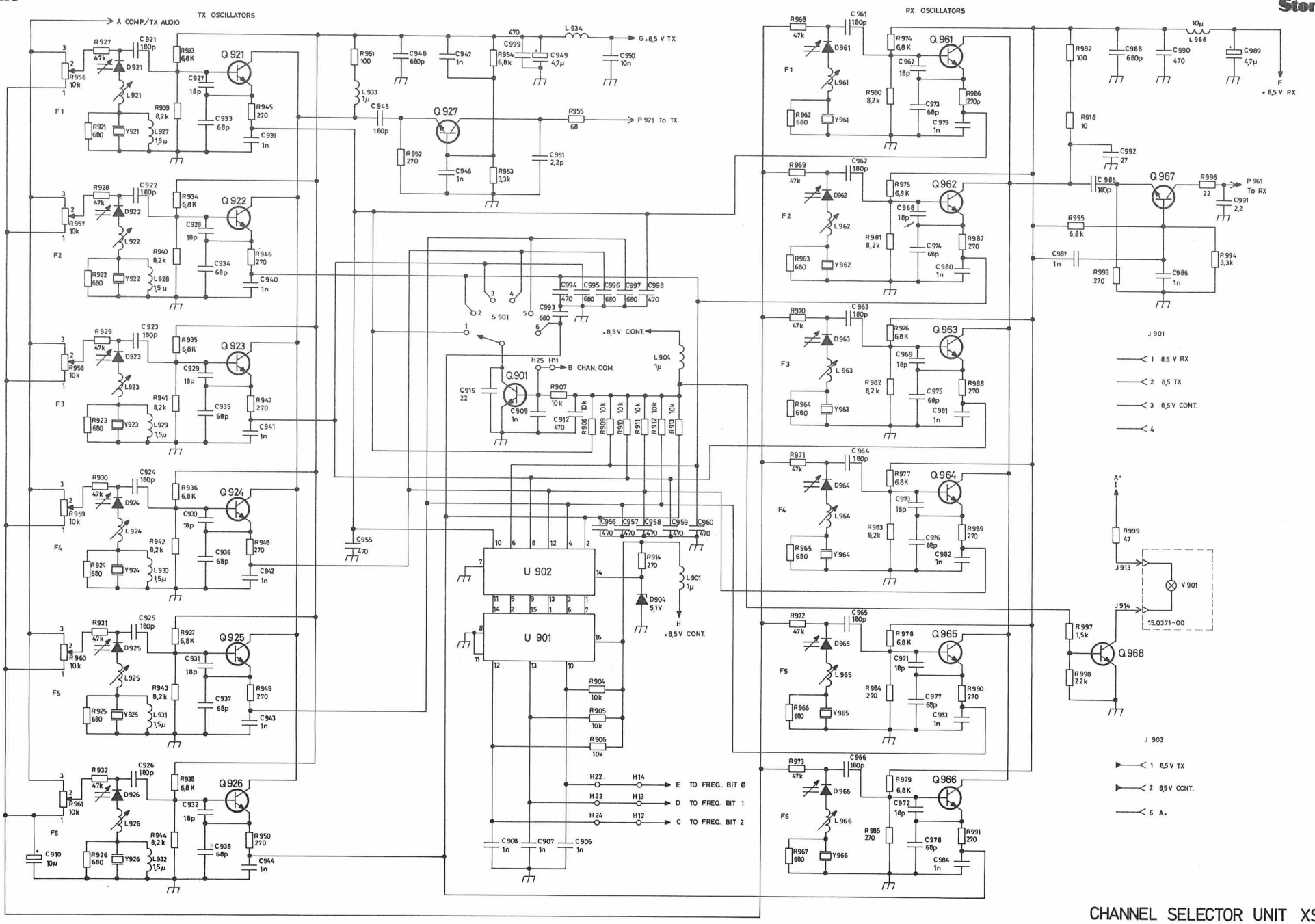
THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (T- NUMBERS) ARE INSTALLED IN CQM5000 SETS.

XS5112	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H12 - H24	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H3 - H4	+	–	–	–	–	+	+	+	+
H5 - H6	+	–	–	–	–	+	+	+	+
H7 - H8	+	+	+	+	+	–	–	+	–
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	–	–	–	–	+	+	+	+

CHANNEL SELECTOR UNIT
XS 5112

D402.636

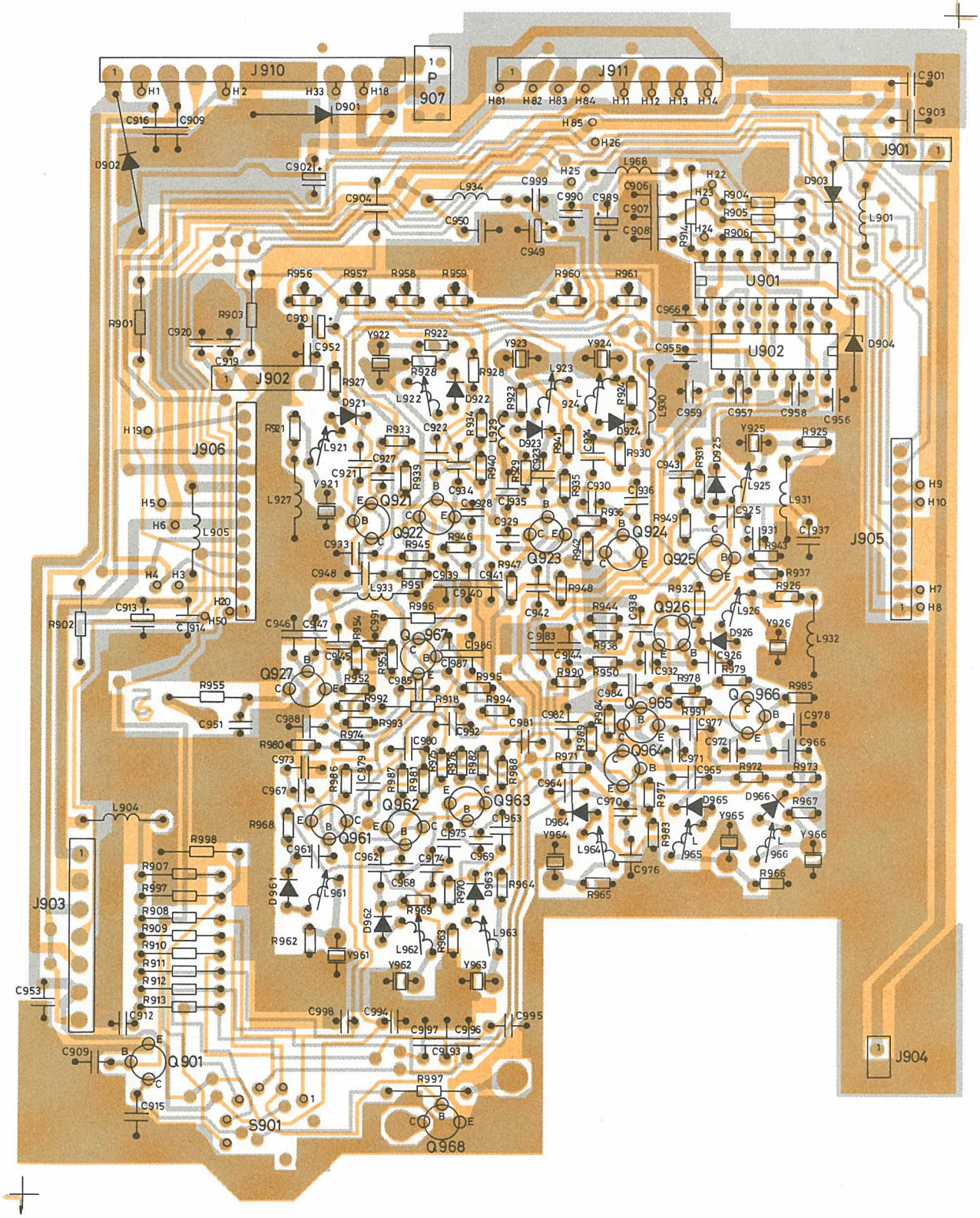
Storno



CHANNEL SELECTOR UNIT XS 5112
OSCILLATOR SECTION

D402.618

Storno



CHANNEL SELECTOR UNIT XS5112
INTERCONNECTION SECTION

D402.619/3

TYPE	Nº	CODE	DATA	
	C901	74.5396	680pF 20% Ceram DI	50V
	C902	73.5165	220uF -10/+100% Elco	25V
	C903	74.5396	680pF 20% Ceram DI	50V
	C904	74.5141	22nF 5% Polyest FL	50V
	C905	74.5397	1nF 20% Ceram DI	50V
	C906	74.5397	1nF 20% Ceram DI	50V
	C907	74.5397	1nF 20% Ceram DI	50V
	C908	74.5397	1nF 20% Ceram DI	50V
	C909	74.5397	1nF 20% Ceram DI	50V
	C910	73.5173	10uF 20% Tantal	16V
	C911	74.5397	1nF 20% Ceram DI	50V
	C912	74.5395	470pF 5% Ceram DI	50V
	C913	73.5173	10 pF 20% Tantal	16V
	C914	74.5396	680 pF 20% Ceramic DI	50V
	C915	74.5375	22 pF 5% Ceramic DI	50V
	C915	74.5363	2.2 pF 0.25 pF Ceramic DI	50V
	C916	74.5377	33 pF 5% Ceramic DI	50V
	C916	74.5377	33 pF 5% Ceramic DI	50V
	C917	74.5391	100 pF 20% Ceramic DI	50V
	C918	74.5391	100 pF 20% Ceramic DI	50V
	C921	74.5405	180pF 5% Ceram DI	50V
	C922	74.5386	180pF 5% Ceram DI	50V
	C923	74.5386	180pF 5% Ceram DI	50V
	C924	74.5386	180pF 5% Ceram DI	50V
	C925	74.5386	180pF 5% Ceram DI	50V
	C926	74.5386	180pF 5% Ceram DI	50V
	C927	74.5403	18pF 5% Ceram DI	50V
	C928	74.5403	18pF 5% Ceram DI	50V
	C929	74.5403	18pF 5% Ceram DI	50V
	C930	74.5403	18pF 5% Ceram DI	50V
	C931	74.5403	18pF 5% Ceram DI	50V
	C932	74.5403	18pF 5% Ceram DI	50V
	C933	74.5405	68pF 5% Ceram DI	50V
	C934	74.5405	68pF 5% Ceram DI	50V
	C935	74.5405	68pF 5% Ceram DI	50V
	C936	74.5405	68pF 5% Ceram DI	50V
	C937	74.5405	68pF 5% Ceram DI	50V
	C939	74.5397	1nF 20% Ceram DI	50V
	C940	74.5397	1nF 20% Ceram DI	50V
	C941	74.5397	1nF 20% Ceram DI	50V
	C942	74,5397	1nF 20% Ceram DI	50V
	C943	74.5397	1nF 20% Ceram DI	50V
	C944	74.5397	1nF 20% Ceram DI	50V
	C945	74.5386	180pF 5% Ceram DI	50V
	C946	74.5397	1nF 20% Ceram DI	50V
	C947	74.5397	1nF 20% Ceram DI	50V
	C948	74.5396	680pF 20% Ceram DI	50V
	C949	73.5172	4.7uF 20% Tantal	35V

TYPE	Nº	CODE	DATA	
	C950	76.5135	10nF 10% Polyest FL	50V
	C961	74.5386	180pF 5% Ceram DI	50V
	C962	74.5386	180pF 5% Ceram DI	50V
	C963	74.5386	180pF 5% Ceram DI	50V
	C964	74.5386	180pF 5% Ceram DI	50V
	C965	74.5386	180pF 5% Ceram DI	50V
	C966	74.5386	180pF 5% Ceram DI	50V
	C967	74.5403	18pF 5% Ceram DI	50V
	C968	74.5403	18pF 5% Ceram DI	50V
	C969	74.5403	18pF 5% Ceram DI	50V
	C970	74.5403	18pF 5% Ceram DI	50V
	C971	74.5403	18pF 5% Ceram DI	50V
	C972	74.5403	18pF 5% Ceram DI	50V
	C973	74.5405	68pF 5% Ceram DI	50V
	C974	74.5405	68 pF 5% Ceramic DI	50V
	C975	74.5405	68pF 5% Ceram DI	50V
	C976	74.5405	68pF 5% Ceram DI	50V
	C977	74.5405	68pF 5% Ceram DI	50V
	C978	74.5405	68pF 5% Ceram DI	50V
	C979	74.5397	1nF 20% Ceram DI	50V
	C980	74.5397	1nF 20% Ceram DI	50V
	C981	74.5397	1nF 20% Ceram DI	50V
	C982	74.5397	1nF 20% Ceram DI	50V
	C983	74.5397	1nF 20% Ceram DI	50V
	C984	74.5397	1nF 20% Ceram DI	50V
	C985	74.5386	180pF 5% Ceram DI	50V
	C986	74.5377	33 pF 5% Ceramic DI	50V
	C987	74.5397	1nF 20% Ceram DI	50V
	C988	74.5396	680pF 20% Ceram DI	50V
	C989	73.5172	4.7 20% Tantal	35V
	C990	76.5135	10nF 10% Polyest FL	50V
	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	

CHANNEL SWITCH XS5112

X402.646

TYPE	Nº	CODE	DATA	
	D963	99.5341	Varicap	
	D964	99.5341	Varicap	
	D965	99.5341	Varicap	
	J901	41.0228	Male connector	4 pin
	J902	41.0228	Male connector	4 pin
	J903	41.0229	Male connector	7 pin
	J904	41.0225	Male connector	2 pin
	J905	41.0227	Male connector	12 pin
	J906	41.0227	Male connector	12 pin
	J907	41.5545	Fem. connector	3 pin
	J910	41.0232	Male connector	11 pin
	J911	41.0231	Male connector	8 PIN
	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	1 pin
	P961	41.5550	Male connector	1 pin
	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	

Storno

TYPE	Nº	CODE	DATA	
	Q962	99.5294	PN2369 Transistor	
	Q963	99.5347	PN2369 Transistor	
	Q964	99.5294	PN2369 Tranisitor	
	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	0.125W
	R902	80.5249	1 Kohm 5% Carbon film	0.125W
	R903	80.5266	27 Kohm 5% Carbon film	0.125W
	R904	80.5261	10 Kohm 5% Carbon film	0.125W
	R905	80.5261	10 Kohm 5% Carbon film	0.125W
	R906	80.5261	10 Kohm 5% Carbon film	0.125W
	R907	80.5261	10 Kohm 5% Carbon film	0.125W
	R908	80.5261	10 Kohm 5% Carbon film	0.125W
	R909	80.5261	10 Kohm 5% Carbon film	0.125W
	R910	80.5261	10 Kohm 5% Carbon film	0.125W
	R911	80.5261	10 Kohm 5% Carbon film	0.125W
	R912	80.5261	10 Kohm 5% Carbon film	0.125W
	R913	80.5261	10 Kohm 5% Carbon film	0.125W
	R914	80.5242	270 ohm 5% Carbon film	0.125W
	R918	80.8225	10 ohm 5% Carbon film	0.125W
	R921	80.5247	680 ohm 5% Carbon film	0.125W
	R922	80.5247	680 ohm 5% Carbon film	0.125W
	R923	80.5247	680 ohm 5% Carbon film	0.125W
	R924	80.5247	680 ohm 5% Carbon film	0.125W
	R925	80.5247	680 ohm 5% Carbon film	0.125W
	R926	80.5247	680 ohm 5% Carbon film	0.125W
	R927	80.5269	47 Kohm 5% Carbon film	0.125W
	R928	80.5269	47 Kohm 5% Carbon film	0.125W
	R929	80.5269	47 Kohm 5% Carbon film	0.125W
	R930	80.5269	47 Kohm 5% Carbon film	0.125W
	R931	80.5269	47 Kohm 5% Carbon film	0.125W
	R932	80.5269	47 Kohm 5% Carbon film	0.125W
	R933	80.5261	10 Kohm 5% Carbon film	0.125W
	R934	80.5261	10 Kohm 5% Carbon film	0.125W
	R935	80.5261	10 Kohm 5% Carbon film	0.125W
	R936	80.5261	10 Kohm 5% Carbon film	0.125W
	R937	80.5261	10 Kohm 5% Carbon film	0.125W
	R938	80.5261	10 Kohm 5% Carbon film	0.125W
	R939	80.5260	8.2 Kohm 5% Carbon film	0.125W

CHANNEL SWITCH XS5112

X402.646

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TYPE	Nº	CODE	DATA	
	R940	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R941	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R942	80:5260	8.2 Kohm 5% Carbon film	0.125W
	R943	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R944	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R945	80.5242	270 ohm 5% Carbon film	0.125W
	R946	80.5242	270 ohm 5% Carbon film	0.125W
	R947	80.5242	270 ohm 5% Carbon film	0.125W
	R948	80.5242	270 ohm 5% Carbon film	0.125W
	R949	80.5242	270 ohm 5% Carbon film	0.125W
	R950	80.5242	270 ohm 5% Carbon film	0.125W
	R951	80.5237	100 ohm 5% Carbon film	0.125W
	R952	80.5242	270 ohm 5% Carbon film	0.125W
	R953	80.5255	3.3 Kohm 5% Carbon film	0.125W
	R954	80.5259	6.8 Kohm 5% Carbon film	0.125W
	R955	80.5235	68 ohm 5% Carbon film	0.125W
	R956	86.5079	10 Kohm 10% Potentiometer	0.5W
	R957	86.5079	10 Kohm 10% Potentiometer	0.5W
	R958	86.5079	10 Kohm 10% Potentiometer	0.5W
	R959	86.5079	10 Kohm 10% Potentiometer	0.5W
	R960	86.5079	10 Kohm 10% Potentiometer	0.5W
	R961	86.5079	10 Kohm 10% Potentiometer	0.5W
	R962	80.5247	680 ohm 5% Carbon film	0.125W
	R963	80.5247	680 ohm 5% Carbon film	0.125W
	R964	80.5247	680 ohm 5% Carbon film	0.125W
	R965	80.5247	680 ohm 5% Carbon film	0.125W
	R966	80.5247	680 ohm 5% Carbon film	0.125W
	R967	80.5247	680 ohm 5% Carbon film	0.125W
	R968	80.5269	47 Kohm 5% Carbon film	0.125W
	R969	80.5269	47 Kohm 5% Carbon film	0.125W
	R970	80.5269	47 Kohm 5% Carbon film	0.125W
	R971	80.5269	47 Kohm 5% Carbon film	0.125W
	R972	80.5269	47 Kohm 5% Carbon film	0.125W
	R973	80.5269	47 Kohm 5% Carbon film	0.125W
	R974	80.5261	10 Kohm 5% Carbon film	0.125W
	R975	80.5261	10 Kohm 5% Carbon film	0.125W
	R976	80.5261	10 Kohm 5% Carbon film	0.125W
	R977	80.5261	10 Kohm 5% Carbon film	0.125W
	R978	80.5261	10 Kohm 5% Carbon film	0.125W
	R979	80.5261	10 Kohm 5% Carbon film	0.125W
	R980	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R981	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R982	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R983	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R984	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R985	80.5260	8.2 Kohm 5% Carbon film	0.125W
	R986	80.5242	270 ohm 5% Carbon film	0.125W
	R987	80.5242	270 ohm 5% Carbon film	0.125W

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TYPE	Nº	CODE	DATA	
	R988	80.5242	270 ohm 5% Carbon film	0.125W
	R989	80.5242	270 ohm 5% Carbon film	0.125W
	R990	80.5242	270 ohm 5% Carbon film	0.125W
	R991	80.5242	270 ohm 5% Carbon film	0.125W
	R992	80.5237	100 ohm 5% Carbon film	0.125W
	R993	80.5242	270 ohm 5% Carbon film	0.125W
	R994	80.5255	3.3 Kohm 5% Carbon film	0.125W
	R995	80.5259	6.8 Kohm 5% Carbon film	0.125W
	R996	80.5229	22 ohm 5% Carbon film	0.125W
	R997	80.5251	1.5 Kohm 5% Carbon film	0.125W
	R998	80.5265	22 Kohm 5% Carbon film	0.125W
	R999	80.5233	47 ohm 5% Carbon film	0.125W
	S901	47.0643	Channel switch	
	U901	14.5133	4028 BCD/DEC. decoder	
	U902	14.5025	6405N Hex. inverter O.C	

CHANNEL SWITCH XS5112

X402, 646

STORNOPHONE 5000
Maintenance Manual
Section 4

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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: ±5kHz
CQM5333: ±4kHz
CQM5334: ±2.5kHz

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
$-30^{o}C$ to $+60^{o}C$

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

Weight
1.8kg.

RECEIVER

Sensitivity
12dB SINAD (EIA), ½ e.m.f.
0.3uV (0.25uV)
EIA measuring conditions:
$\Delta f = \pm 2/3 \times \Delta f$ max; f_{mod} = 1kHz

20dB SINAD (CEPT), e.m.f.
CQM5332: 0.75uV (0.55uV)
CQM5333: 0.75uV (0.55uV)
CQM5334: 1.0uV (0.75uV)

CEPT measuring conditions:
Δf = 60% Δf max; f_{mod} = 1kHz
Measured with psophometric filter.

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Crystal Frequency Range
38.35 - 49.35

Crystal Frequency Calculation (fx)

$fx = \frac{Fs + 10.7}{2} MHz$

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%)
$\Delta f = 60\% \Delta f$ 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 - 3000Hz

Hum 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)

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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)

$fx = \frac{Fs}{4}$

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 filter

Attack Time
50ms

Current Consumption
6W: less than 3.5A (2.5A)
25W: less than 6.0A (5.0A)

Storno

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:

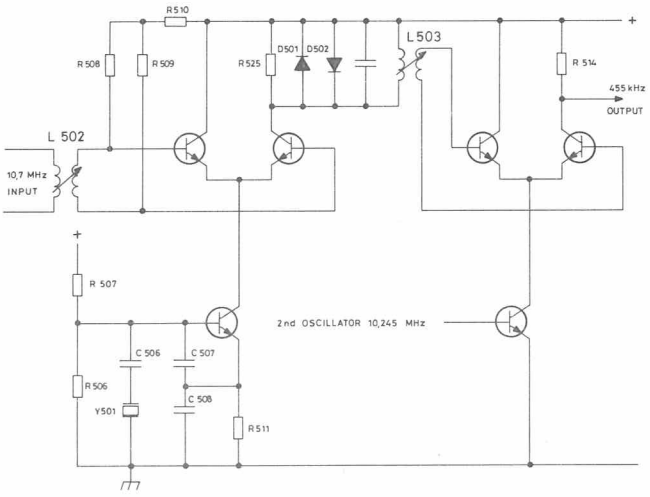
Receiver front end
1st IF section with first and second oscillator
455kHz 2nd IF portion with demodulator.

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 charateristics 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 deside 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 based 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 is two versions; one (XS5331) has space for accomodating two transmit and two receive channels; one (XS5332) has space

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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 fusable printed wiring path which will open in case of the ground wire being accidently 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 monolitic 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.

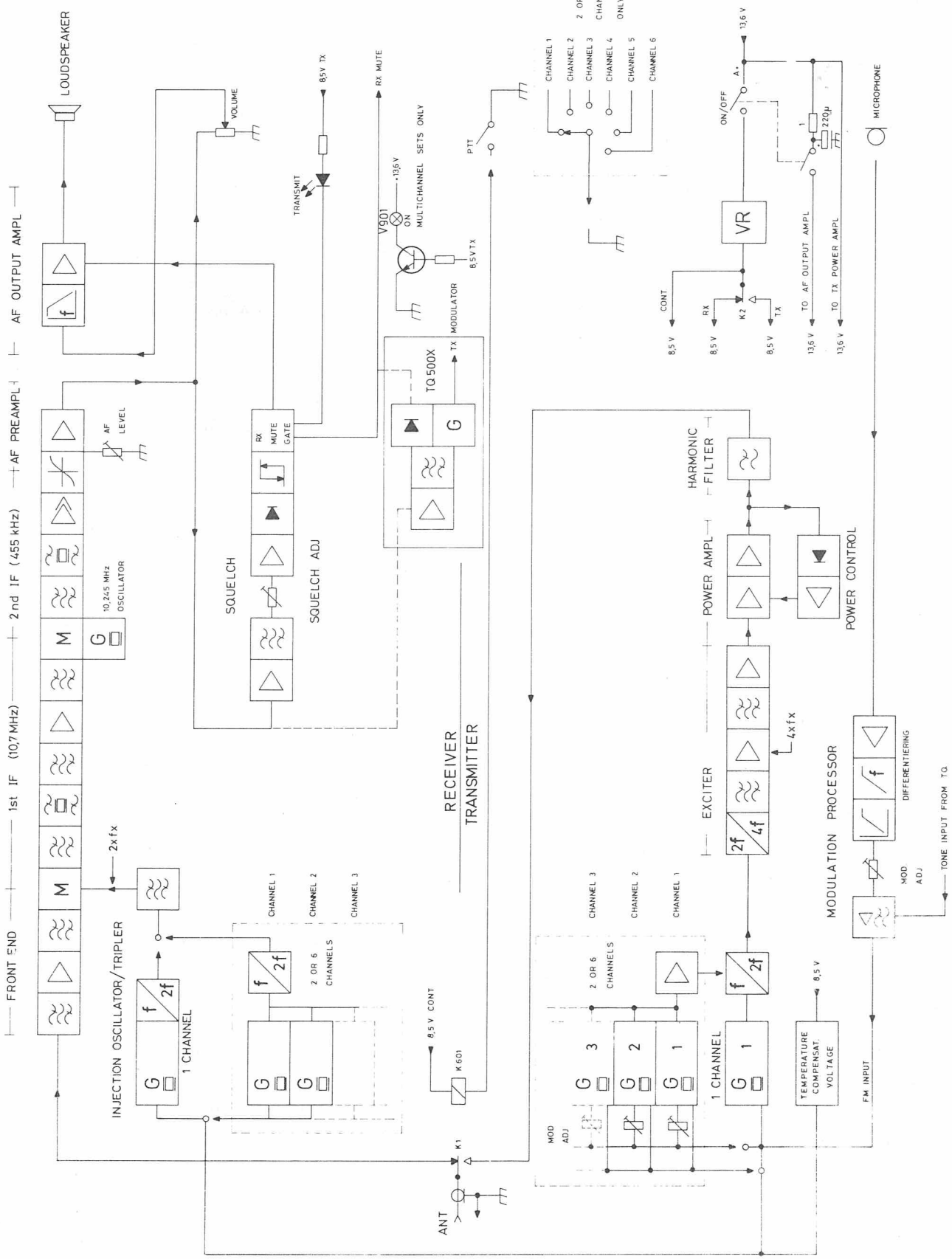
In sets with 5-tone sequential option or Pilot tone, the PTT (Push to talk) lead runs through the option board to provide for correct tone keying function.

Storno

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 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$1Mohm
AC Voltmeter	Z_{in} >1Mohm//50pF
Multimeter	R_i $\geq$20Kohm/Volt
Distortion meter	e.g. Storno E11c
RF Watt meter	25W/50ohm/66-88MHz
RF generator	Z_{out}= 50ohm; 66-88MHz
10.7 MHz signal generator	e.g. Storno TS-G21B
Frequency counter with attenuator	Z_{in} = 50ohm; 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.

Miscellaneous

4ohm/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 ±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

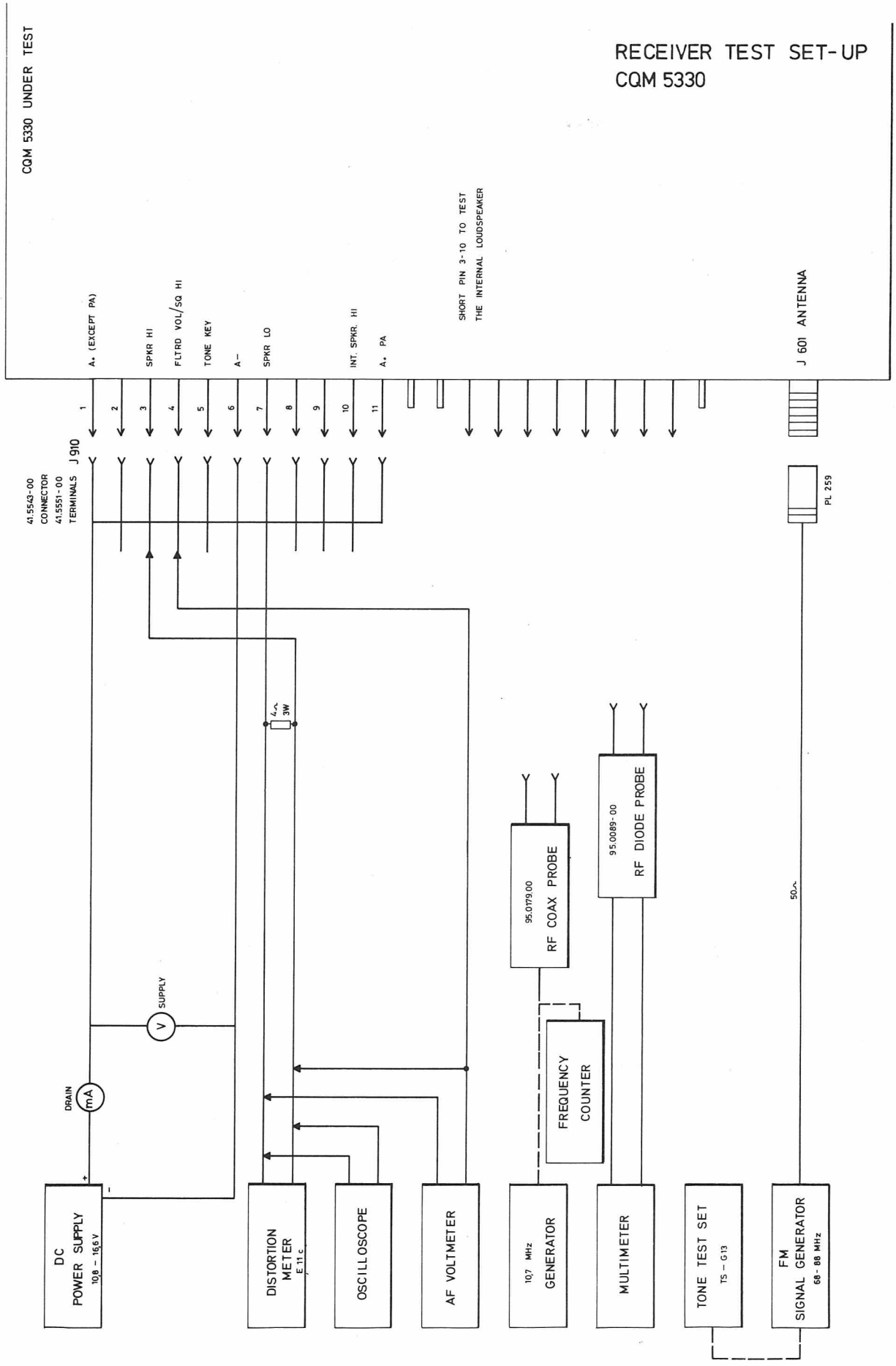
Adjust the power supply voltage to 16.6V and read the 8.5V regulated. Compare the change in the 8.5 volt regulated to the value obtained at 13.2V.

Requirement: $\leq$50mV

Repeat the procedure with the power supply adjusted for 10.8V

Storno

RECEIVER TEST SET-UP
CQM 5330



60.446-E1

Storno

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 $F_{antenna}$ +10,7MHz

Single channel sets

Adjust L301 for the specified frequency ($2xf_x$)
This adjustment shall be performed at 25°C
Requirement: F_{nom} ±0.4ppm (±30Hz 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_{nom} ±0.4ppm (±30Hz at 75MHz)
ppm= parts per million= x 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.

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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 = ±3kHz
CQM5333 = ±2.4kHz
CQM5334 = ±1.5kHz

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 ±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 immeadiately 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 2/3xΔfmax., 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 + destortion, 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: ≤0.75uV.
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: ≤0.3uV (½ 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, ΔF = 60% ΔF max and 1000Hz measure the output voltage according to the following table:

	Frequency	Level	Tol.
Type CQM5332 Type CQM5334	300Hz	+9dB	+1dB/-3dB
	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 ≤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	≤150mA	≤160mA	≤200mA
Receive 2W AF ~ 2.83V r.m.s. across 4ohm.	≤500mA	≤510mA	≤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 is 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

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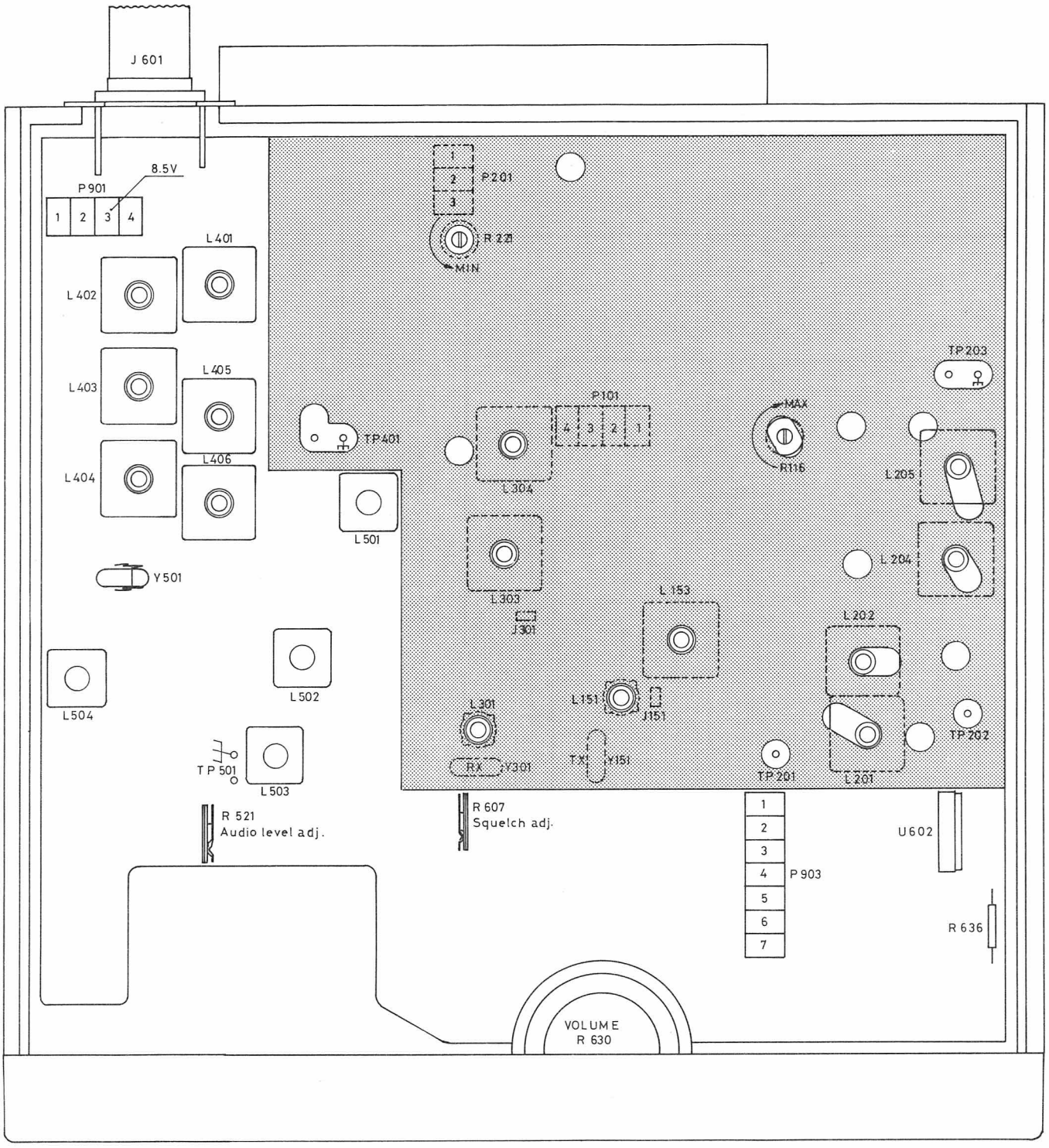
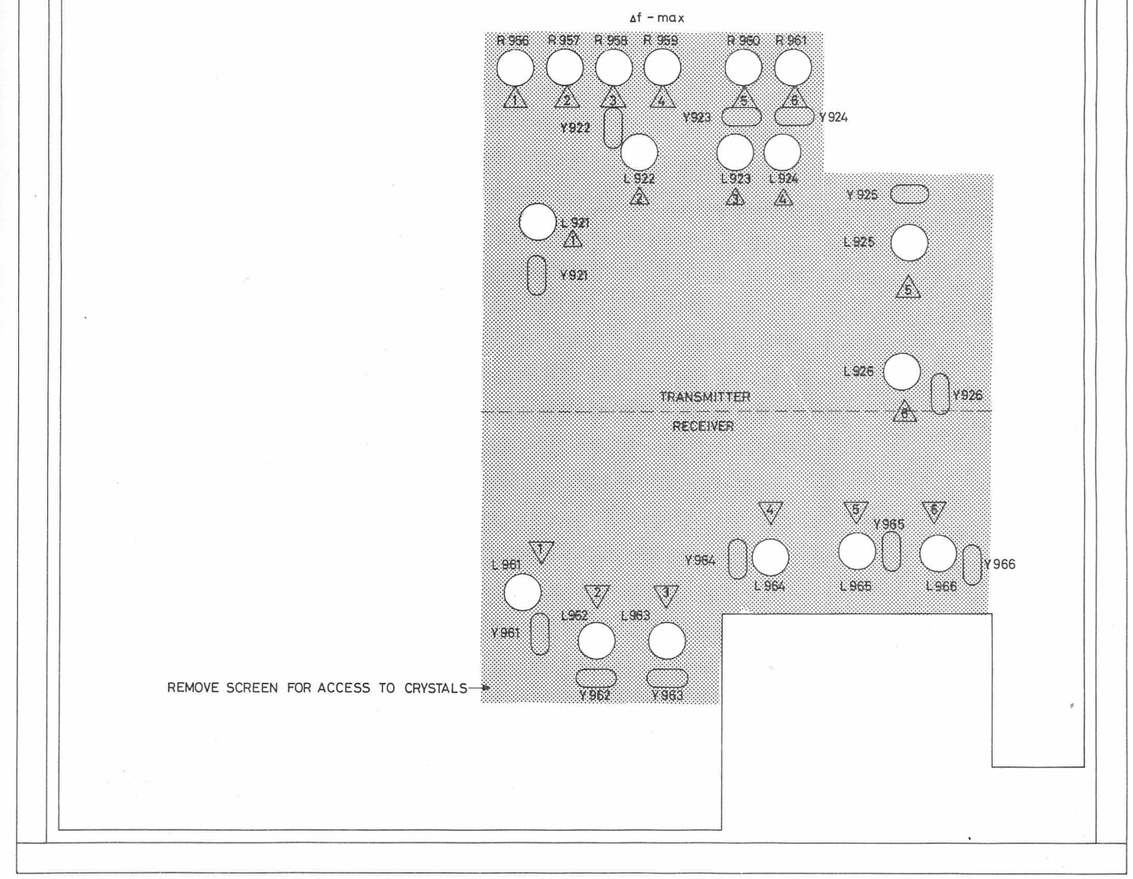


ADJUSTABLE COMPONENTS AND TEST POINTS ON RF5330

D402.792

Storno



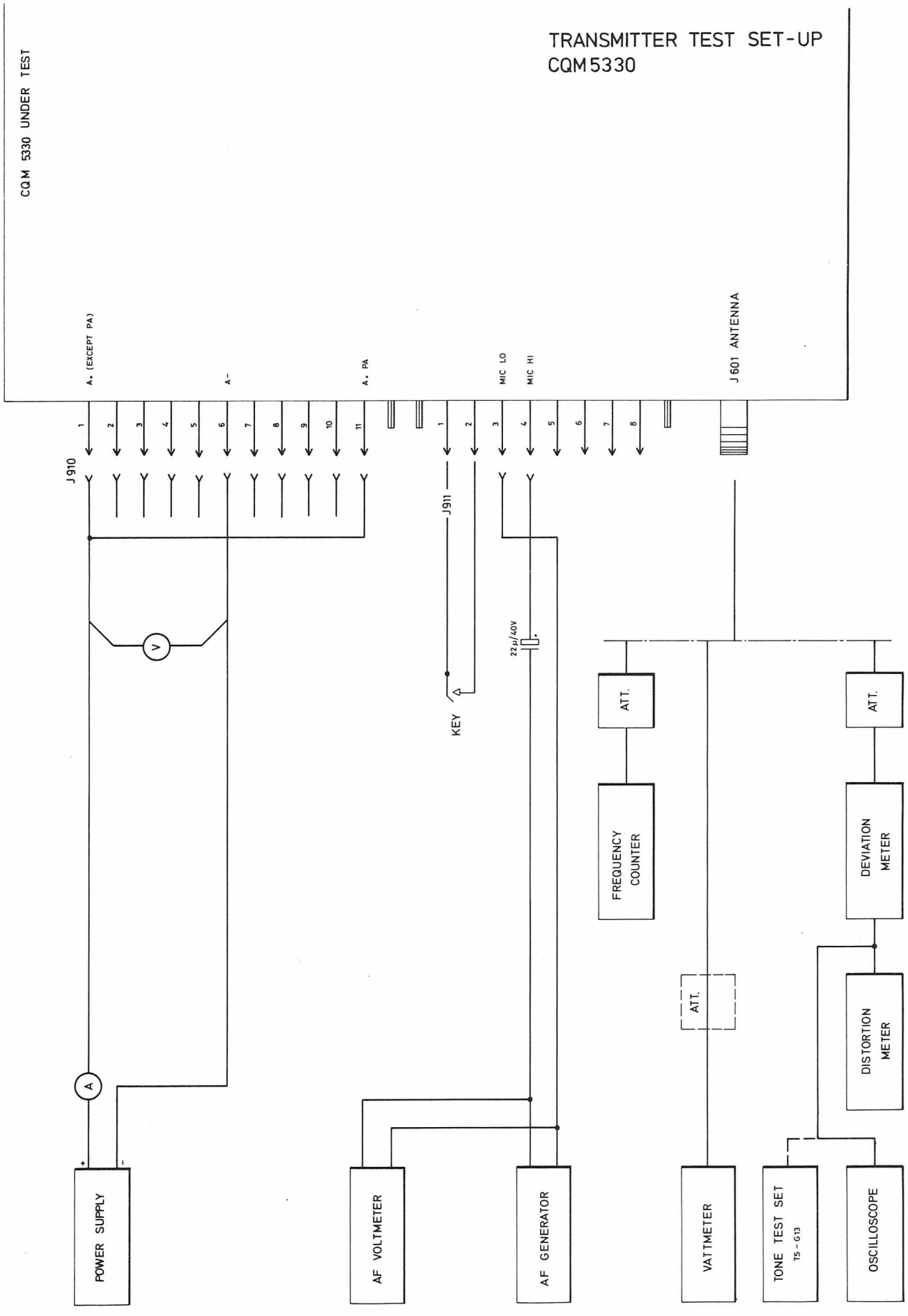
▽ = RECEIVER CHANNEL

△ = TRANSMITTER CHANNEL

ADJUSTABLE COMPONENTS AND TEST POINTS ON XS5111 / XS5112 AND XS5331 / XS5332

D402.624/2

Storno


TRANSMITTER TEST SET-UP
CQM5330
CQM 5330 UNDER TEST
A+ (EXCEPT PA)
A-
A+ PA
MIC LO
MIC HI
J 601 ANTENNA
J910
J911
KEY
22µ/40V
V
A
+
-
POWER SUPPLY
AF VOLTMETER
AF GENERATOR
ATT.
FREQUENCY COUNTER
ATT.
VATTMETER
ATT.
DEVIATION METER
DISTORTION METER
TONE TEST SET
TS-613
OSCILLOSCOPE

Storno

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 af 25°C.
Requirement: F_{nom} ±0.4ppm.

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} ±0.1dB.
Measure the RF power output at 16V, 13.2V and 10.8V.
Requirements (25W):

Voltage	Power	Current
16.6V	25W (ref)	≤5.8A
13.2V	≥23.5W	≤5.8A
10.8V	≥20W	≤5.8A

Requirements (6W):

Voltage	Power	Current
16V	6W (ref)	≤2.6A
13.2V	≥5.2W	≤2.6A
10.8V	≥5.0W	≤2.6A

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	±5kHz
CQM5333	20kHz	±4kHz
CQM5334	12.5kHz	±2.5kHz

Requirement
Difference between + and - deviation: ≤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 : ±3.0kHz
CQM5333 : ±2.4kHz
CQM5334 : ±1.5kHz

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

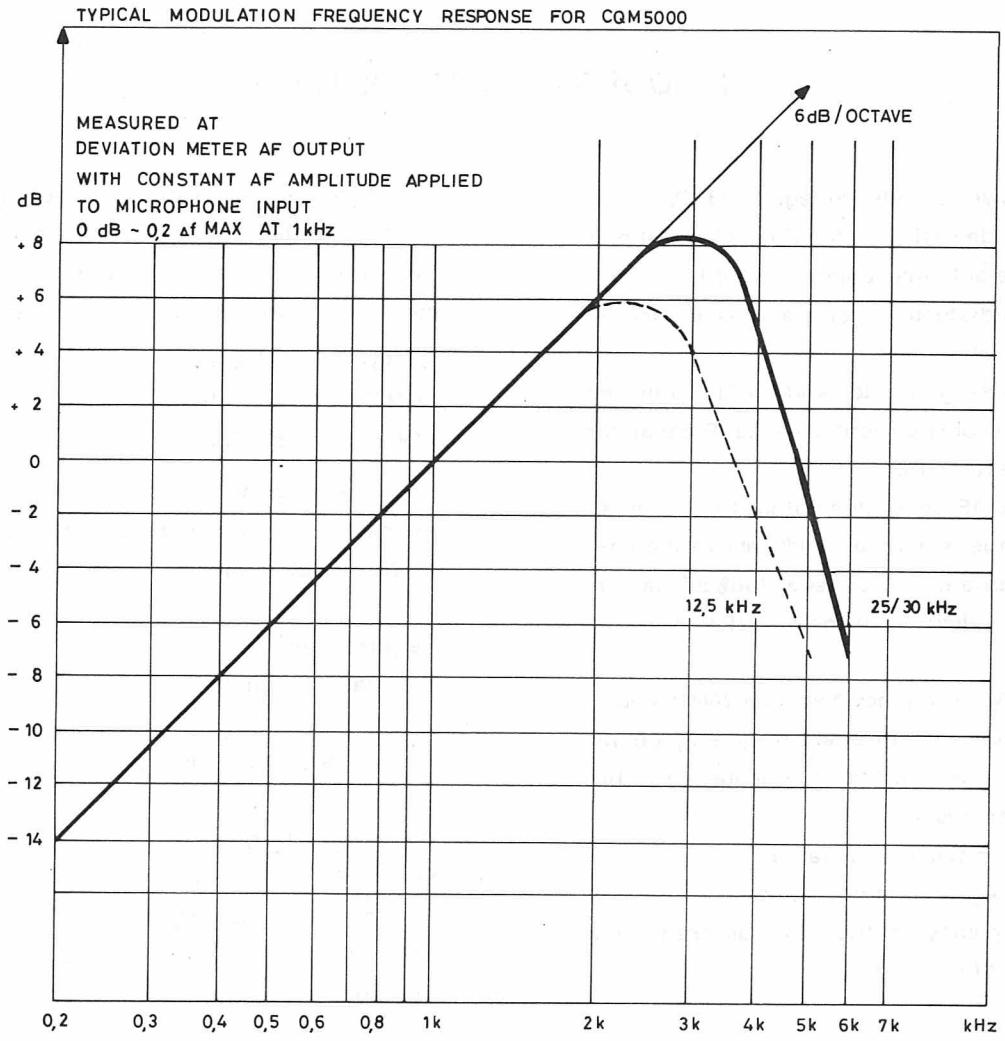
Requirements:
Modulating signal: 75mV ±2dB
Distortion: ≤7%
(measured without deemphasis)

Modulation frequency response
Set the AF generator to 1000Hz.
Reduce the AF generator output until a deviation of 0.2 x Δf max is obtained on the deviation meter.

CQM5332 : ±1.0kHz
CQM5333 : ±0.8kHz
CQM5334 : ±0.5kHz

Vary the frequency of the generator and note the deviation changes as refered 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.

Storno


TYPICAL MODULATION FREQUENCY RESPONSE FOR CQM5000
MEASURED AT
DEVIATION METER AF OUTPUT
WITH CONSTANT AF AMPLITUDE APPLIED
TO MICROPHONE INPUT
0 dB ~ 0,2 Δf MAX AT 1kHz
6dB / OCTAVE
12,5 kHz
25/30 kHz
dB
+ 8
+ 6
+ 4
+ 2
0
- 2
- 4
- 6
- 8
- 10
- 12
- 14
0,2
0,3
0,4
0,5
0,6
0,8
1k
2k
3k
4k
5k
6k
7k
kHz

NOTE 1:
Z 501 AND Z 502 ARE NOT INCLUDED IN
15.0364-00 AND
15.0365-00

P901

8,5V RX
8,5V CONT
8,5V TX
PTT (OLYD)

FROM TRANSMITTER

RX FRONT END

MIXER

IF AMPLIFIER / IF CONVERTER
U 501

IF AMPLIFIER / DETECTOR
U 502

AUDIO LEVEL ADJ.

VOLUME CONTROL

P903

6 12,6V
2 8,5V CONT.
5 SPKR HI
7 FLTRD VOL/SQ HI
2 8,5V CONT.
3 VOL/SQ HI
1 8,5V TX
4 RX MUTE

RX OSCILLATOR

SQUELCH

8,5 V

8,5 V TX

STRAP TO BE MOUNTED IN ALL SETS EXCEPT US-VERSIONS.

NOTE 2:
VALUE OF R636 DEPENDS ON COLOUR MARK ON U602:

U602 GROUP	R636 VALUE Ω (NO. R636)
BROWN	270
RED	100
ORANGE	47
YELLOW	22
GREEN	0
BLUE	68

NOTE 4:
TO MODIFY FOR MULTIFREQUENCY REMOVE R157 TO DISABLE TX OSCILLATOR AND/OR R309 TO DISABLE RX OSCILLATOR.

CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF MICROFARADS. INDUCTANCE VALUES IN NANOHENRYS UNLESS FOLLOWED BY UH µ MICROHENRYS, MH µ MILLIHENRYS.

* COMPONENT VALUES

COMP.	25W	6W	COMP.	25W	6W
L 214	YES	-	C 228	270 pF	-
L 219	YES	-	C 229	68 pF	110 pF
L 225	-	YES	C 230	470 pF	47 pF
L 224	-	YES	C 231	470 pF	-
Q 206	YES	-	C 232	82 pF	-
			C 233	240 pF	-
			C 234	82 pF	-
			C 235	100 pF	-
			C 236	470 p	-
			C 248	-	22 pF
			C 368	-	1 nF
			Z 201	YES	-
			Z 203	YES	-
			L 211	A	B
			L 212	YES	-
			L 213	YES	-

▲ PART OF PRINTED WIRE BOARD

P101

COMP AUDIO OUT
C.G HI
MIC HI
MIC LO

MOD ADJ.

NOTE 3:
RF 5332 FOR SWEDEN - R 109 = 1,8 KΩ
RF 5334 - R 109 = 1,8 KΩ, C 108 = 10n

TX OSCILLATOR

TX EXCITER

TX POWER AMPLIFIER

TO ANTENNA RELAY

P201

1 A+
3 8,5V TX

RF UNIT RF 5330

D402.775/4

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	50V
	C106	73.5170	1.0uF 20% Tantal	35V
	C107	73.5172	4.7uF 20% Tantal	35V
5332	C108	76.5140	6.8nF 5% Polyester FL	50V
5333	C108	76.5140	6.8nF 5% Polyester FL	50V
5334	C108	76.5135	10nF 5% Polyester FL	50V
	C109	76.5156	1nF 5% Polyester FL	50V
	C110	73.5172	4.7uF 20% Tantal	35V
	C111	76.5151	68nF 5% Polyester FL	63V
	C112	74.5392	150pF 5% Ceram DI	50V
	C113	74.5374	18pF 5% Ceram DI	50V
	C151	73.5173	10uF 20% Tantal	16V
	C153	74.5389	330pF 5% Ceram DI	50V
	C154	74.5398	1.5nF 20% Ceram DI	50V
	C155	74.5389	330pF 5% Ceram DI	50V
	C156	74.5417	100pF 5% Ceram DI	50V
	C157	74.5372	12pF 5% Ceram DI	50V
	C158	74.5372	12pF 5% Ceram DI	50V
	C159	74.5380	56pF 5% Ceram DI	50V
	C160	74.5380	56pF 5% Ceram DI	50V
	C201	74.5398	1.5nF 20% Ceram DI	50V
	C202	74.5373	15pF 5% Ceram DI	50V
	C203	79.5007	0.82pF Phenolic TB	500V
	C204	74.5374	18pF 5% Ceram DI	50V
	C205	74.5382	82pF 5% Ceram DI	50V
	C206	74.5398	1.5nF 20% Ceram DI	50V
	C207	74.5398	1.5nF 20% Ceram DI	50V
	C208	74.5398	1.5nF 20% Ceram DI	50V
	C209	74.5398	1.5nF 20% Ceram DI	50V
	C210	74.5373	15pF 5% Ceram DI	50V
	C211	73.5171	2.2uF 20% Tantal	35V
	C212	74.5397	1nF 20% Ceram DI	50V
	C213	74.5397	1nF 20% Ceram DI	50V
	C214	79.5008	1pF Phenolic TB	500V
	C215	74.5373	15pF 5% Ceram DI	50V
	C216	74.5379	47pF 5% Ceram DI	50V
	C217	74.5397	1nF 20% Ceram DI	50V
	C218	74.5376	27pF 5% Ceram DI	50V
	C219	74.5397	1nF 20% Ceram DI	50V
	C220	74.5377	33pF 5% Ceram DI	50V
	C221	74.5379	47pF 5% Ceram DI	50V
	C222	75.5047	240pF 2% Mica	250V
	C223	76.5144	0.1uF 10% Polyester FL	63V
	C224	73.5173	10uF 20% Tantal	16V
	C225	74.5392	150pF 5% Ceram DI	50V

Storno

TYPE	Nº	CODE	DATA	
	C226	74.5395	470pF 20% Ceram DI	50V
	C227	74.5415	27pF 5% Ceram DI	500V
25W	C228	75.5048	270pF 5% Mica	250V
25W	C229	75.5046	68pF 5% Mica	250V
6W	C229	75.5026	110pF 5% Mica	250V
6W	C230	75.5044	47pF 2% Teflon	250V
25W	C230	75.5049	470pF 5% Mica	250V
25W	C231	75.5049	470pF 5% Mica	250V
25W	C232	74.5418	56pF 5% Ceram DI	500V
25W	C233	75.5047	240pF 2% Mica	250V
25W	C234	75.5032	82pF 2% Mica	250V
25W	C235	75.5020	100pF 5% Mica	250V
	C236	76.5144	0.1uF 10% Polyester FL	63V
	C237	73.5172	4.7uF 20% Tantal	35V
	C238	74.5392	150pF 5% Ceram DI	50V
25W	C239	74.5395	470pF 20% Ceram DI	50V
	C240	74.5365	3.3pF 0.25pF Ceram DI	50V
	C241	74.5392	150pF 5% Ceram DI	50V
	C242	73.5173	10uF 20% Tantal	16V
	C243	75.5043	16pF 0.5pF Teflon	250V
	C244	75.5044	47pF 2% Teflon	250V
	C245	75.5045	56pF 2% Mica	250V
	C246	75.5043	16pF 0.5pF Teflon	250V
	C247	74.5398	1.5nF 20% Ceram DI	50V
6W	C248	74.5015	1nF -20 +50% Ceram DI	400V
6W	C249	74.5375	22pF 5% Ceram DI	50V
	C301	74.5398	1.5nF 20% Ceram DI	50V
	C302	76.5135	10nF 10% Polyester FL	50V
	C303	74.5386	180pF 5% Ceram DI	50V
	C304	74.5398	1.5nF 20% Ceram DI	50V
	C305	19J706256P206	100pF 5% Ceram DI	50V
	C306	19A700002P35	27pF 5% Ceram DI	50V
	C307	74.5372	12pF 5% Ceram DI	50V
	C308	74.5386	180pF 5% Ceram DI	50V
	C309	79.5005	0.56pF Phenolic TB	500V
	C310	74.5372	12pF 5% Ceram DI	50V
	C311	74.5375	22pF 5% Ceram DI	50V
	C312	73.5172	4.7uF 20% Tantal	35V
	C313	74.5375	22pF 5% Ceram DI	50V
	C401	74.5373	15pF 5% Ceram DI	50V
	C402	74.5373	15pF 5% Ceram DI	50V
	C403	79.5007	0.82pF Phenolic TB	500V

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TYPE	Nº	CODE	DATA	
	C404	74.5398	1.5nF 20% Ceram DI	50V
	C405	74.5398	1.5nF 20% Ceram DI	50V
	C406	74.5398	1.5nF 20% Ceram DI	50V
	C407	74.5373	15pF 5% Ceram DI	50V
	C408	74.5373	15pF 5% Ceram DI	50V
	C409	79.5008	1pF Phenolic TB	500V
	C411	74.5366	3.9pF 0.25pF Ceram DI	50V
	C412	74.5372	12pF 5% Ceram DI	50V
	C413	76.5132	3.3nF 10% Polyester FL	50V
	C414	76.5135	10nF 10% Polyester FL	50V
	C415	74.5389	330pF 5% Ceram DI	50V
	C416	19J706280P1	2.2nF 10% Ceram	125V
	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
	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

Storno

TYPE	Nº	CODE	DATA	
	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
	C634	80.5213	1ohm 5% Carbon film	1/8W
	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	1.6V 20mA
	D607	99.5237	1N4148 Diode	
	J151	41.5529	Socket	
	J301	41.5529	Socket	
	J601	41.5165	Connector	
	K601	58.5085	2121 Relay	12V
	L151	61.5052	16-22MHz RF coil	
	L152	61.5031	10uH 10% RF choke	300mA
	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	800mA
	L209	62.1017	RF coil	
	L210	62.1018	RF coil	
25W	L211	62.1019	RF coil	
6W	L211	62.1025	RF coil	
25W	L212	62.1020	RF coil	
25W	L213	62.1021	RF coil	
25W	L214	62.1022	RF coil	

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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	
6W	L224	62.1029	RF coil	
6W	L225	62.1028	RF coil	
	L301	61.5051	38-50MHz RF coil	
	L302	61.5015	3.3uH 10% HF choke	700mA
	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	10mA
	P101	41.5541	Fem. connector	4 pin
	P201	41.5545	Fem. connector	3 pin
	P901	41.5541	Fem. connector	4 pin
	P903	41.0230	Fem. connector	7 pin
	Q151	99.0001	PN2369 Transistor	
	Q201	99.0001	PN2369 Transistor	
	Q202	99.5348	RF transistor	0.4W
	Q203	99.5349	RF transistor	1W/12V
	Q205	99.5369	BLY87C Transistor	
25W	Q206	99.5368	RF transistor	30W
	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	

TYPE	Nº	CODE	DATA	
	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
5332	R109	89.5091	1.3Kohm 5% Carbon film	1/8W
5333	R109	89.5091	1.3Kohm 5% Carbon film	1/8W
5334	R109	89.5252	1.8Kohm 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	80.5253	2.2Kohm 5% Carbon film	1/8W
	R116	86.5050	5Kohm 20% Trim Carbon	0.1W
	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	80.5252	1.8Kohm 5% Carbon film	1/8W
	R156	80.5259	6.8Kohm 5% Carbon film	1/8W
	R157	80.5261	10Kohm 5% Carbon film	1/8W
	R158	80.5242	270ohm 5% Carbon film	1/8W
	R159	80.5263	15Kohm 5% Carbon film	1/8W
	R160	80.5257	4.7Kohm 5% Carbon film	1/8W
	R201	80.5249	1Kohm 5% Carbon film	1/8W
	R202	80.5257	4.7Kohm 5% Carbon film	1/8W
	R203	80.5233	47ohm 5% Carbon film	1/8W
	R204	80.5233	47ohm 5% Carbon film	1/8W
	R205	80.5233	47ohm 5% Carbon film	1/8W
	R206	80.5254	2.7Kohm 5% Carbon film	1/8W
	R207	80.5241	220ohm 5% Carbon film	1/8W
	R208	80.5225	10ohm 5% Carbon film	1/8W
	R209	80.5225	10ohm 5% Carbon film	1/8W
	R210	80.5229	22ohm 5% Carbon film	1/8W
	R211	80.5228	18ohm 5% Carbon film	1/8W

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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	80.5259	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	80.5254	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

Storno

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

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TYPE	Nº	CODE	DATA	
	R632	80.5213	1ohm 5% Carbon film	1/8W
	R633	80.5238	120ohm 5% Carbon film	1/8W
	R635	80.5234	56ohm 5% Carbon film	1/8W
	R637	80.5247	680ohm 5% Carbon film	1/8W
	R638	80.5413	1ohm 5% Carbon film	1/4W
	R639	80.5237	100ohm 5% Carbon film	1/8W
	T201	61.1385	RF transformer	
	U101	14.5141	LM4558 Dual op-amp.	
	U501	14.5128	CA3054 IF amplifier	
	U502	14.5129	TBA750 IF amplifier	
	U601	14.5130	TDA2002 AF - power amplifier	
	U602	14.0133	Voltage regulator	
	Y501	98.5010	10.245MHz Crystal	98-12
	Z201	61.1384	Damping choke	
25W	Z202	61.1384	Damping choke	
	Z203	61.1384	Damping choke	
5332	Z501	69.5037	10.7MHz Crystal filter	25/30kHz
5333	Z501	69.5038	10.7MHz Crystal filter	20kHz
5334	Z501	69.5039	10.7MHz Crystal filter	12.5kHz
5332	Z502	69.5045	455kHz Ceramic filter	
5333	Z502	69.5045	455kHz Ceramic filter	
5334	Z502	69.5046	455kHz Ceramic filter	

Storno

TYPE	Nº	CODE	DATA

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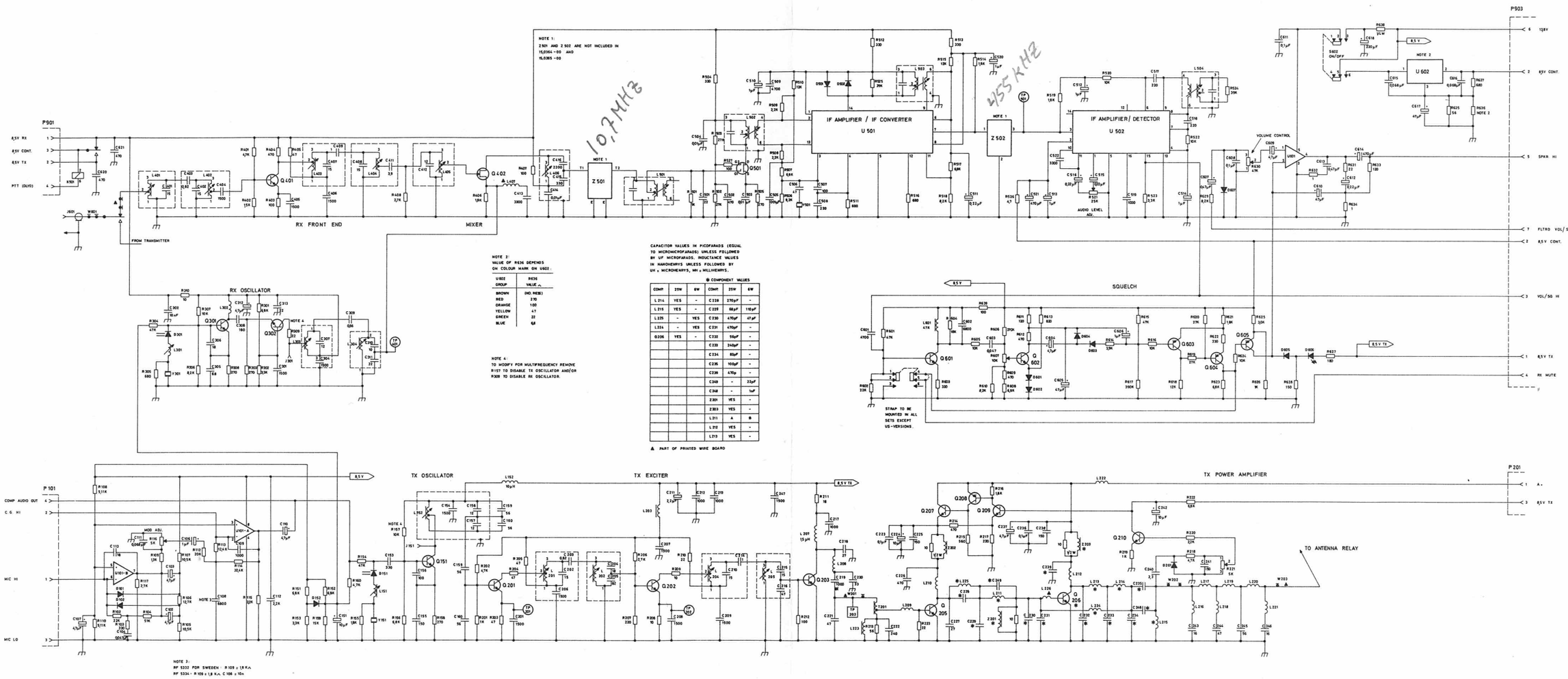
Storno



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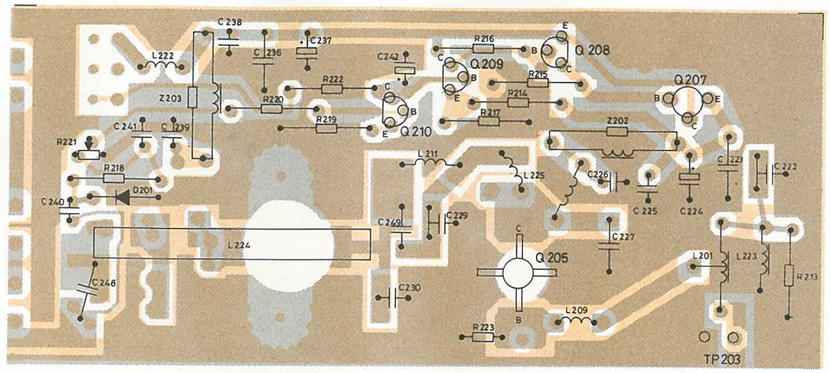
Storno

Storno

6 WATT TRANSMITTER



RF UNIT RF 5330
25W, 6W

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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	50V
	C106	73.5170	1.0uF 20% Tantal	35V
	C107	73.5172	4.7uF 20% Tantal	35V
5332	C108	76.5140	6.8nF 5% Polyester FL	50V
5333	C108	76.5140	6.8nF 5% Polyester FL	50V
5334	C108	76.5135	10nF 5% Polyester FL	50V
	C109	76.5156	1nF 5% Polyester FL	50V
	C110	73.5172	4.7uF 20% Tantal	35V
	C111	76.5151	68nF 5% Polyester FL	63V
	C112	74.5392	150pF 5% Ceram DI	50V
	C113	74.5374	18pF 5% Ceram DI	50V
	C151	73.5173	10uF 20% Tantal	16V
	C153	74.5389	330pF 5% Ceram DI	50V
	C154	74.5398	1.5nF 20% Ceram DI	50V
	C155	74.5385	150pF 5% Ceram DI	50V
	C156	74.5417	100pF 5% Ceram DI	50V
	C157	74.5372	12pF 5% Ceram DI	50V
	C158	74.5372	12pF 5% Ceram DI	50V
	C159	74.5380	56pF 5% Ceram DI	50V
	C160	74.5380	56pF 5% Ceram DI	50V
	C201	74.5398	1.5nF 20% Ceram DI	50V
	C202	74.5373	15pF 5% Ceram DI	50V
	C203	79.5007	0.82pF Phenolic TB	500V
	C204	74.5374	18pF 5% Ceram DI	50V
	C205	74.5382	82pF 5% Ceram DI	50V
	C206	74.5398	1.5nF 20% Ceram DI	50V
	C207	74.5398	1.5nF 20% Ceram DI	50V
	C208	74.5398	1.5nF 20% Ceram DI	50V
	C209	74.5398	1.5nF 20% Ceram DI	50V
	C210	74.5373	15pF 5% Ceram DI	50V
	C211	73.5171	2.2uF 20% Tantal	35V
	C212	74.5397	1nF 20% Ceram DI	50V
	C213	74.5397	1nF 20% Ceram DI	50V
	C214	79.5008	1pF Phenolic TB	500V
	C215	74.5373	15pF 5% Ceram DI	50V
	C216	74.5379	47pF 5% Ceram DI	50V
	C217	74.5397	1nF 20% Ceram DI	50V
	C218	74.5376	27pF 5% Ceram DI	50V
	C219	74.5397	1nF 20% Ceram DI	50V
	C220	74.5377	33pF 5% Ceram DI	50V
	C221	74.5379	47pF 5% Ceram DI	50V
	C222	75.5047	240pF 2% Mica	250V
	C223	76.5144	0.1uF 10% Polyester FL	63V
	C224	73.5173	10uF 20% Tantal	16V
	C225	74.5392	150pF 5% Ceram DI	50V
	C226	74.5395	470pF 20% Ceram DI	50V

Storno

TYPE	Nº	CODE	DATA	
	C227	74.5415	27pF 5% Ceram DI	500V
25W	C228	75.5048	270pF 5% Mica	250V
25W	C229	75.5046	68pF 5% Mica	250V
6W	C229	75.5026	110pF 5% Mica	250V
6W	C230	75.5044	47pF 2% Teflon	250V
25W	C230	75.5049	470pF 5% Mica	250V
25W	C231	75.5049	470pF 5% Mica	250V
25W	C232	74.5418	56pF 5% Ceram DI	500V
25W	C233	75.5047	240pF 2% Mica	250V
25W	C234	75.5032	82pF 2% Mica	250V
25W	C235	75.5020	100pF 5% Mica	250V
	C236	76.5144	0.1uF 10% Polyester FL	63V
	C237	73.5172	4.7uF 20% Tantal	35V
	C238	74.5392	150pF 5% Ceram DI	50V
25W	C239	74.5395	470pF 20% Ceram DI	50V
	C240	74.5365	3.3pF 0.25pF Ceram DI	50V
	C241	74.5392	150pF 5% Ceram DI	50V
	C242	73.5173	10uF 20% Tantal	16V
	C243	75.5043	16pF 0.5pF Teflon	250V
	C244	75.5044	47pF 2% Teflon	250V
	C245	75.5045	56pF 2% Mica	250V
	C246	75.5043	16pF 0.5pF Teflon	250V
	C247	74.5398	1.5nF 20% Ceram DI	50V
6W	C248	74.5015	1nF -20 +50% Ceram DI	400V
6W	C249	74.5375	22pF 5% Ceram DI	50V
	C301	74.5398	1.5nF 20% Ceram DI	50V
	C302	76.5135	10nF 10% Polyester FL	50V
	C303	74.5386	180pF 5% Ceram DI	50V
	C304	74.5398	1.5nF 20% Ceram DI	50V
	C305	74.5405	68pF 5% Ceram DI	50V
	C306	74.5403	18pF 5% Ceram DI	50V
	C307	74.5372	12pF 5% Ceram DI	50V
	C308	74.5386	180pF 5% Ceram DI	50V
	C309	79.5005	0.56pF Phenolic TB	500V
	C310	74.5372	12pF 5% Ceram DI	50V
	C311	74.5375	22pF 5% Ceram DI	50V
	C312	73.5172	4.7uF 20% Tantal	35V
	C313	74.5375	22pF 5% Ceram DI	50V
	C401	74.5373	15pF 5% Ceram DI	50V
	C402	74.5373	15pF 5% Ceram DI	50V
	C403	79.5007	0.82pF Phenolic TB	500V
	C404	74.5398	1.5nF 20% Ceram DI	50V
	C405	74.5398	1.5nF 20% Ceram DI	50V

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TYPE	Nº	CODE	DATA	
	C406	74.5398	1.5nF 20% Ceram DI	50V
	C407	74.5373	15pF 5% Ceram DI	50V
	C408	74.5373	15pF 5% Ceram DI	50V
	C409	79.5008	1pF Phenolic TB	500V
	C411	74.5366	3.9pF 0.25pF Ceram DI	50V
	C412	74.5372	12pF 5% Ceram DI	50V
	C413	76.5132	3.3nF 10% Polyester FL	50V
	C414	76.5135	10nF 10% Polyester FL	50V
	C415	74.5389	330pF 5% Ceram DI	50V
	C416	76.5131	2.2nF 10% Polyester FL	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
	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

Storno

TYPE	Nº	CODE	DATA	
	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
	C634	80.5213	1ohm 5% Carbon film	1/8W
	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	1.6V 20mA
	D607	99.5237	1N4148 Diode	
	J151	41.5529	Socket	
	J301	41.5529	Socket	
	J601	41.5165	Connector	
	K601	58.5085	2121 Relay	12V
	L151	61.5052	16-22MHz RF coil	
	L152	61.5031	10uH 10% RF choke	300mA
	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	800mA
	L209	62.1017	RF coil	
	L210	62.1018	RF coil	
25W	L211	62.1019	RF coil	
6W	L211	62.1025	RF coil	
25W	L212	62.1020	RF coil	
25W	L213	62.1021	RF coil	
25W	L214	62.1022	RF coil	
25W	L215	62.1023	RF coil	
	L216	62.1024	RF coil	

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TYPE	Nº	CODE	DATA	
	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	
6W	L224	62.1029	RF coil	
6W	L225	62.1028	RF coil	
	L301	61.5051	38-50MHz RF coil	
	L302	61.5015	3.3uH 10% HF choke	700mA
	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	10mA
	P101	41.5541	Fem. connector	4 pin
	P201	41.5545	Fem. connector	3 pin
	P901	41.5541	Fem. connector	4 pin
	P903	41.0230	Fem. connector	7 pin
	Q151	99.0001	PN2369 Transistor	
	Q201	99.0001	PN2369 Transistor	
	Q202	99.5348	RF transistor	0.4W
	Q203	99.5349	RF transistor	1W/12V
	Q205	99.5369	BLY87C Transistor	
25W	Q206	99.5368	RF transistor	30W
	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	
	Q603	99.5115	BC309 Transistor	
	Q604	99.5115	BC309 Transistor	
	Q605	99.5115	BC309 Transistor	

Storno

TYPE	Nº	CODE	DATA	
	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
5332	R109	89.5091	1.3Kohm 5% Carbon film	1/8W
5333	R109	89.5091	1.3Kohm 5% Carbon film	1/8W
5334	R109	89.5252	1.8Kohm 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	80.5253	2.2Kohm 5% Carbon film	1/8W
	R116	86.5050	5Kohm 20% Trim Carbon	0.1W
	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	80.5252	1.8Kohm 5% Carbon film	1/8W
	R156	80.5259	6.8Kohm 5% Carbon film	1/8W
	R157	80.5261	10Kohm 5% Carbon film	1/8W
	R158	80.5242	270ohm 5% Carbon film	1/8W
	R159	80.5263	15Kohm 5% Carbon film	1/8W
	R160	80.5257	4.7Kohm 5% Carbon film	1/8W
	R201	80.5249	1Kohm 5% Carbon film	1/8W
	R202	80.5257	4.7Kohm 5% Carbon film	1/8W
	R203	80.5233	47ohm 5% Carbon film	1/8W
	R204	80.5233	47ohm 5% Carbon film	1/8W
	R205	80.5233	47ohm 5% Carbon film	1/8W
	R206	80.5254	2.7Kohm 5% Carbon film	1/8W
	R207	80.5241	220ohm 5% Carbon film	1/8W
	R208	80.5225	10ohm 5% Carbon film	1/8W
	R209	80.5225	10ohm 5% Carbon film	1/8W
	R210	80.5229	22ohm 5% Carbon film	1/8W
	R211	80.5228	18ohm 5% Carbon film	1/8W
	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

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TYPE	Nº	CODE	DATA	
	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	80.5259	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	80.5254	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
	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

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	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
	R632	80.5213	1ohm 5% Carbon film	1/8W
	R633	80.5238	120ohm 5% Carbon film	1/8W
	R635	80.5234	56ohm 5% Carbon film	1/8W
	R637	80.5247	680ohm 5% Carbon film	1/8W
	R638	80.5413	1ohm 5% Carbon film	1/4W
	R639	80.5237	100ohm 5% Carbon film	1/8W

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TYPE	Nº	CODE	DATA
	T201	61.1385	RF transformer
	U101	14.5141	LM4558 Dual op-amp.
	U501	14.5128	CA3054 IF amplifier
	U502	14.5129	TBA750 IF amplifier
	U601	14.5130	TDA2002 AF - power amplifier
	U602	14.0133	Voltage regulator
	Y501	98.5010	10.245MHz Crystal 98-12
	Z201	61.1384	Damping choke
25W	Z202	61.1384	Damping choke
	Z203	61.1384	Damping choke
5332	Z501	69.5037	10.7MHz Crystal filter 25/30kHz
5333	Z501	69.5038	10.7MHz Crystal filter 20kHz
5334	Z501	69.5039	10.7MHz Crystal filter 12.5kHz
5332	Z502	69.5045	455kHz Ceramic filter
5333	Z502	69.5045	455kHz Ceramic filter
5334	Z502	69.5046	455kHz Ceramic filter

Storno

TYPE	Nº	CODE	DATA

RF UNIT RF5330

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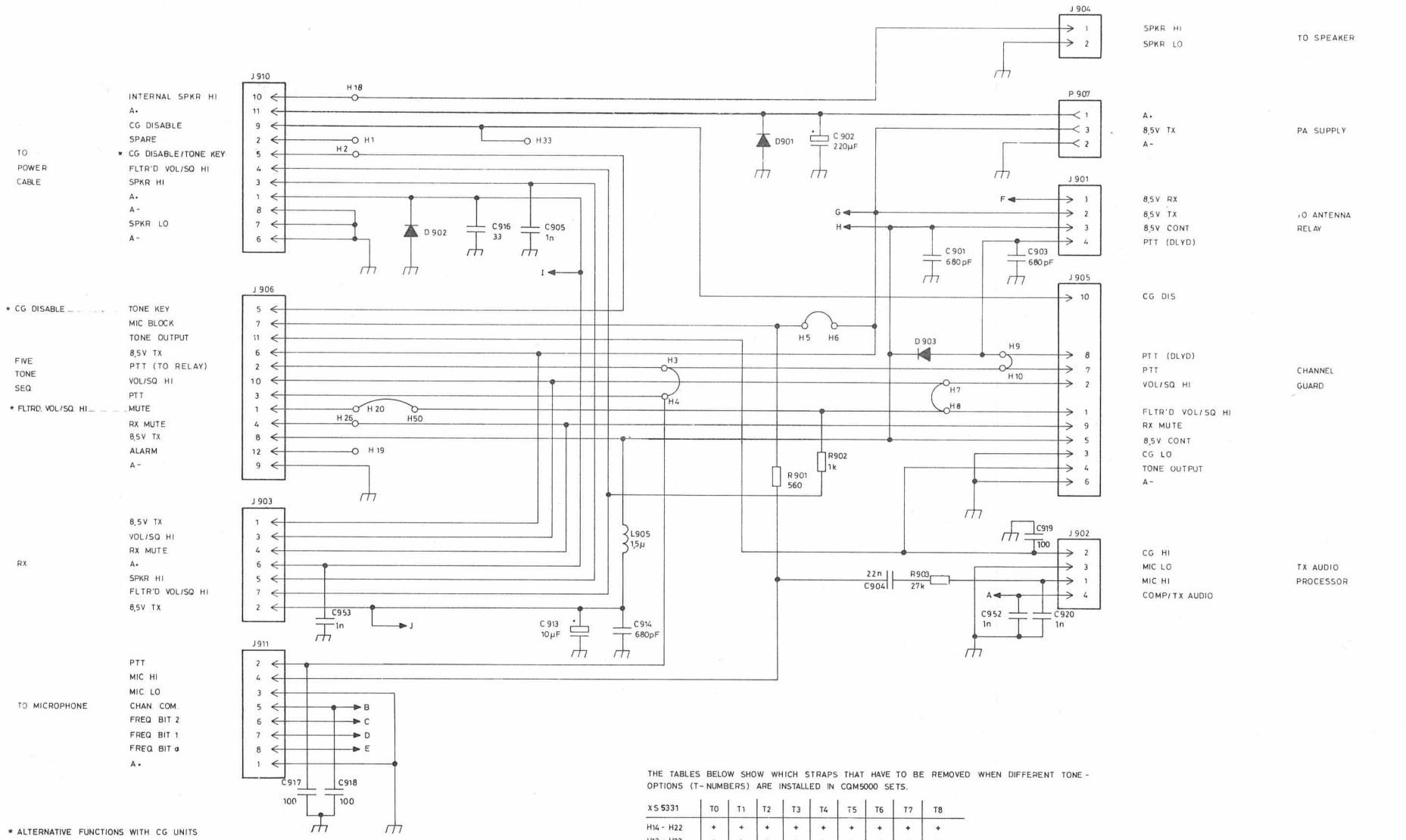
Storno

Storno



* ALTERNATIVE FUNCTIONS WITH CG UNITS TQ 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 CQM5000 SETS.

XS 5331	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H32 - H29	+	+	+	+	+	+	+	+	+
H31 - H30	+	+	+	+	+	+	+	+	+
H3 - H4	+	–	–	–	–	+	+	+	+
H5 - H6	+	–	–	–	–	+	+	+	+
H7 - H8	+	+	+	+	+	–	–	+	–
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	–	–	–	–	+	+	+	+

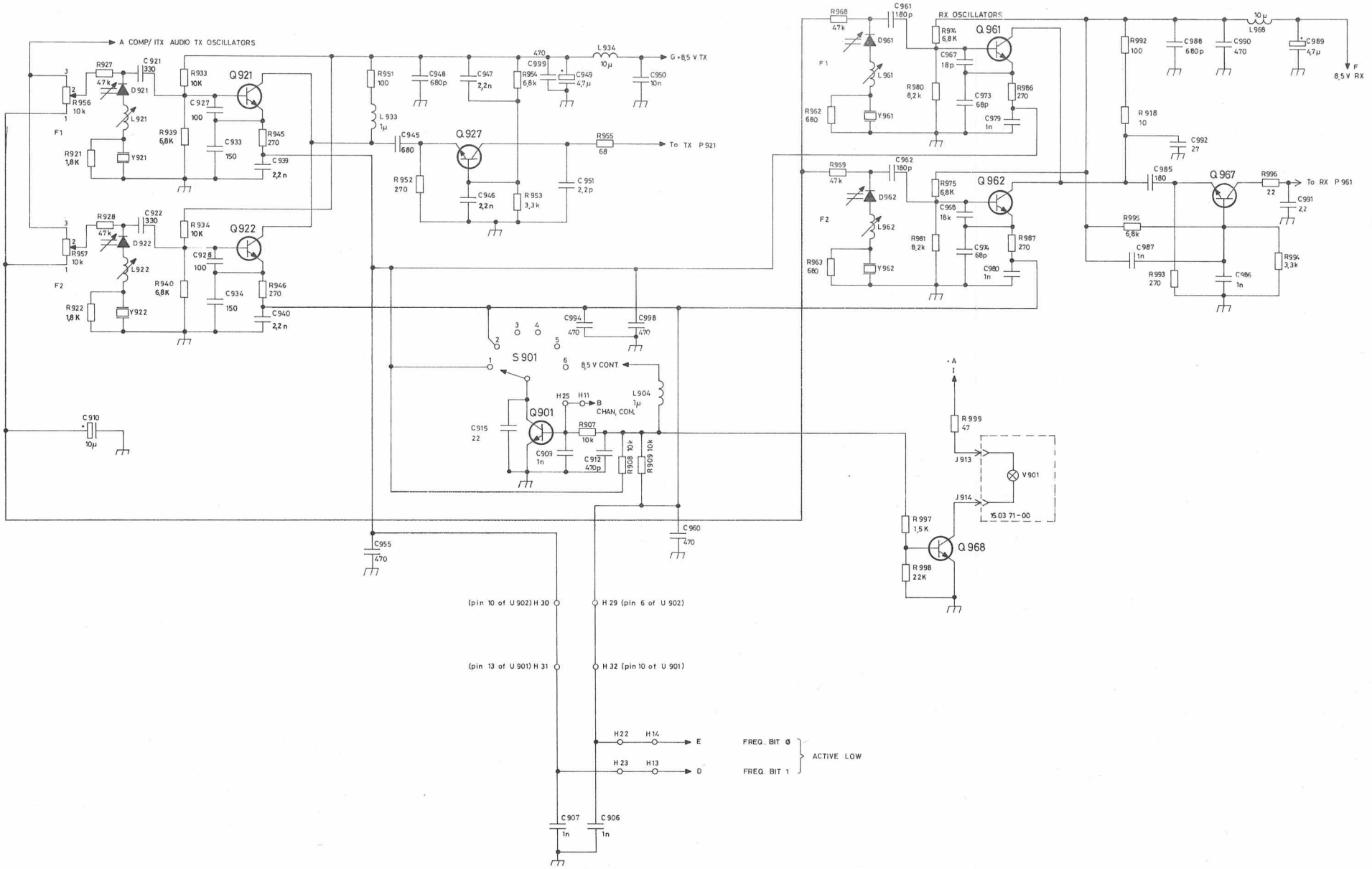
CHANNEL SELECTOR UNIT

XS 5331

D402.771

Storno

Storno



CHANNEL SELECTOR UNIT
OSCILLATOR SECTION
XS 5331

D402.769

Storno

TYPE	Nº	CODE	DATA	
	C901	74.5396	680pF 20% Ceramic DI	50V
	C902	73.5165	220uF -20 +100% Elco	25V
	C903	74.5396	680pF 20% Ceramic DI	50V
	C904	76.5141	22nF 5% Polyester FL	50V
	C905	74.5397	1nF 20% Ceramic DI	50V
	C906	74.5397	1nF 20% Ceramic DI	50V
	C907	74.5397	1nF 20% Ceramic DI	50V
	C909	74.5397	1nF 20% Ceramic DI	50V
	C910	73.5173	10uF 20% Tantal	16V
	C912	74.5395	470pF 20% Ceramic DI	50V
	C913	73.5173	10uF 20% Tantal	16V
	C914	74.5396	680pF 20% Ceramic DI	50V
	C915	74.5375	22pF 5% Ceramic DI	50V
	C916	74.5377	33pF 5% Ceramic DI	50V
	C917	74.5391	100pF 20% Ceramic DI	50V
	C918	74.5391	100pF 20% Ceramic DI	50V
	C919	74.5391	100pF 20% Ceramic DI	50V
	C920	74.5391	100pF 20% Ceramic DI	50V
	C921	74.5389	330pF 5% Ceramic DI	50V
	C922	74.5389	330pF 5% Ceramic DI	50V
	C927	74.5417	100pF 5% Ceramic DI	50V
	C928	74.5417	100pF 5% Ceramic DI	50V
	C933	74.5385	150pF 5% Ceramic DI	50V
	C934	74.5385	150pF 5% Ceramic DI	50V
	C939	74.5399	2.2nF 20% Ceramic DI	50V
	C940	74.5399	2.2nF 20% Ceramic DI	50V
	C945	74.5396	680pF 20% Ceramic DI	50V
	C946	74.5399	2.2nF 20% Ceramic DI	50V
	C947	74.5399	2.2nF 20% Ceramic DI	50V
	C948	74.5396	680pF 20% Ceramic DI	50V
	C949	73.5172	4.7uF 20% Tantal	35V
	C950	76.5135	10nF 10% Polyester FL	50V
	C951	74.5363	2,2pF 0.25pF Ceramic DI	50V
	C952	74.5391	100pF 20% Ceramic DI	50V
	C953	74.5397	1nF 20% Ceramic DI	50V
	C955	74.5395	470pF 20% Ceramic DI	50V
	C960	74.5395	470pF 20% Ceramic DI	50V
	C961	74.5386	180pF 5% Ceramic DI	50V
	C962	74.5386	180pF 5% Ceramic DI	50V
	C967	74.5403	18pF 5% Ceram DI	50V
	C968	74.5403	18pF 5% Ceramic DI	50V
	C973	74.5405	68pF 5% Ceramic DI	50V
	C974	74.5405	68pF 5% Ceramic DI	50V
	C979	74.5397	1nF 20% Ceramic DI	50V
	C980	74.5397	1nF 20% Ceramic DI	50V
	C985	74.5386	180pF 5% Ceramic DI	50V
	C986	74.5397	1nF 20% Ceramic DI	50V

Storno

TYPE	Nº	CODE	DATA	
	C987	74.5397	1nF 20% Ceramic DI	50V
	C988	74.5396	680pF 20% Ceramic DI	50V
	C989	73.5172	4.7uF 20% Tantal	35V
	C990	74.5395	470pF 20% Ceramic DI	50V
	C991	74.5263	2.2pF 0.25pF Ceramic DI	50V
	C992	74.5376	27pF 5% Ceramic DI	50V
	C994	74.5395	470pF 20% Ceramic DI	50V
	C998	74.5395	470pF 20% Ceramic DI	50V
	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	4 pin
	J902	41.0228	Male connector	4 pin
	J903	41.0229	Male Connector	7 pin
	J904	41.0225	Male Connector	2 pin
	J905	41.0245	Male connector	10 pin
	J906	41.0227	Male connector	12 pin
	J907	41.5545	Fem. connector	3 pin
	J910	41.0232	Male cnnector	11 pin
	J911	41.0231	Male connector	8 pin
	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	1 pin
	P961	41.5550	Connector	1 pin
	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

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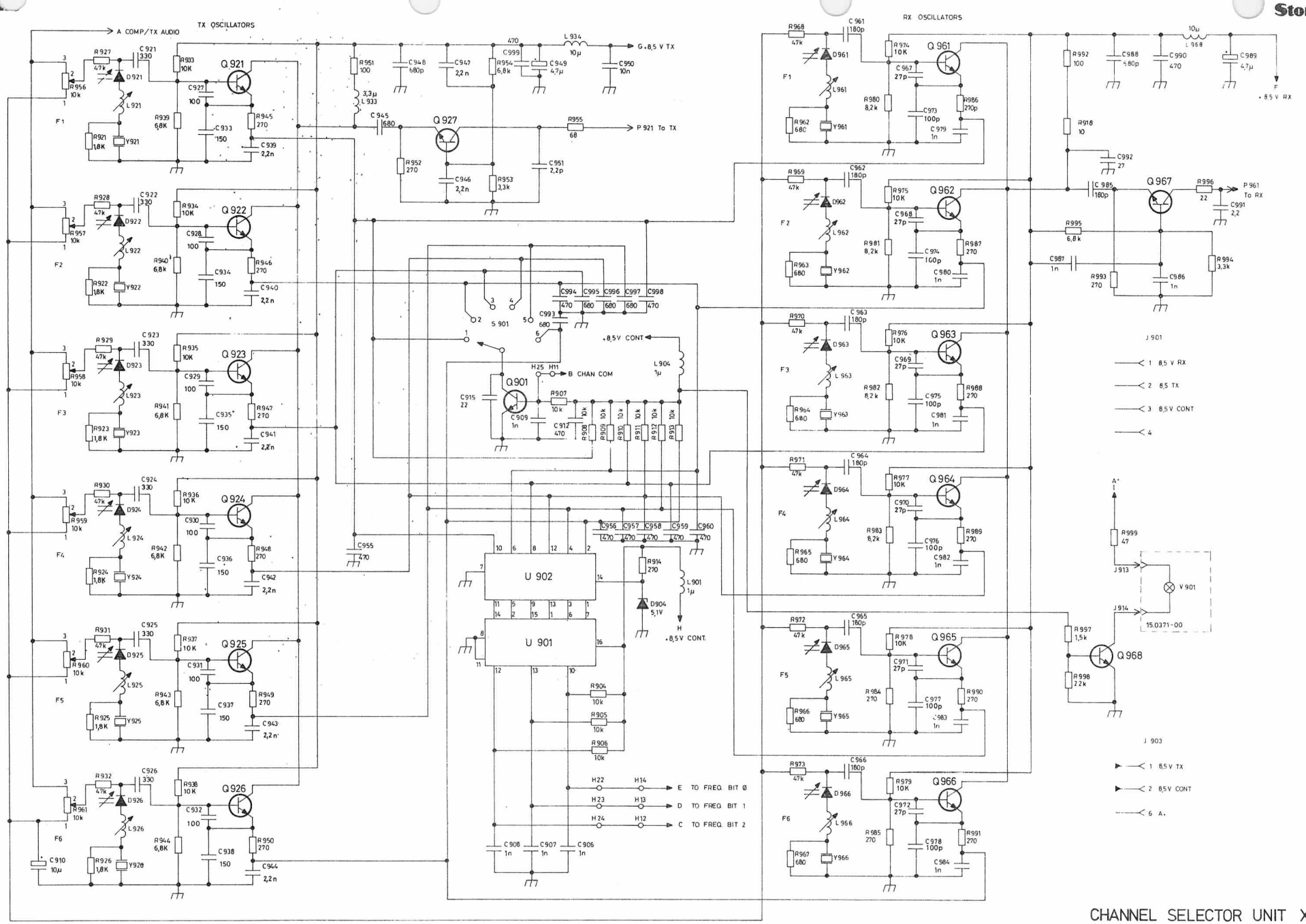
TYPE	Nº	CODE	DATA	
	Q968	99.5121	BC237 Transistor	
	R902	80.5249	1Kohm 5% Carbon film	1/8W
	R903	80.5266	27Kohm 5% Carbon film	1/8W
	R907	80.5261	10Kohm 5% Carbon film	1/8W
	R908	80.5261	10Kohm 5% Carbon film	1/8W
	R909	80.5261	10Kohm 5% Carbon film	1/8W
	R918	80.5225	10ohm 5% Carbon film	1/8W
	R921	80.5252	1.8Kohm 5% Carbon film	1/8W
	R922	80.5252	1.8Kohm 5% Carbon film	1/8W
	R927	80.5269	47Kohm 5% Carbon film	1/8W
	R928	80.5269	47Kohm 5% Carbon film	1/8W
	R933	80.5261	10Kohm 5% Carbon film	1/8W
	R934	80.5261	10Kohm 5% Carbon film	1/8W
	R939	80.5259	6.8Kohm 5% Carbon film	1/8W
	R940	80.5259	6.8Kohm 5% Carbon film	1/8W
	R945	80.5242	270ohm 5% Carbon film	1/8W
	R946	80.5242	279ohm 5% Carbon film	1/8W
	R951	80.5237	100ohm 5% Carbon film	1/8W
	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	80.5235	68ohm 5% Carbon film	1/8W
	R956	86.5079	10Kohm 10% Trim Cermet	1/2W
	R957	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
	R968	80.5269	47Kohm 5% Carbon film	1/8W
	R969	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
	R980	80.5260	8.2Kohm 5% Carbon film	1/8W
	R981	80.5260	8.2Kohm 5% Carbon film	1/8W
	R986	80.5242	270ohm 5% Carbon film	1/8W
	R987	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
	R994	80.5255	3.3Kohm 5% Carbon film	1/8W
	R995	80.5259	6.8Kohm 5% Carbon film	1/8W
	R996	80.5229	22ohm 5% Carbon film	1/8W
	R997	80.5251	1.5Kohm 5% Carbon film	1/8W
	R998	80.5265	22Kohm 5% Carbon film	1/8W
	R999	80.5233	47ohm 5% Carbon film	1/8W

Storno

TYPE	Nº	CODE	DATA

CHANNEL SWITCH XS5331

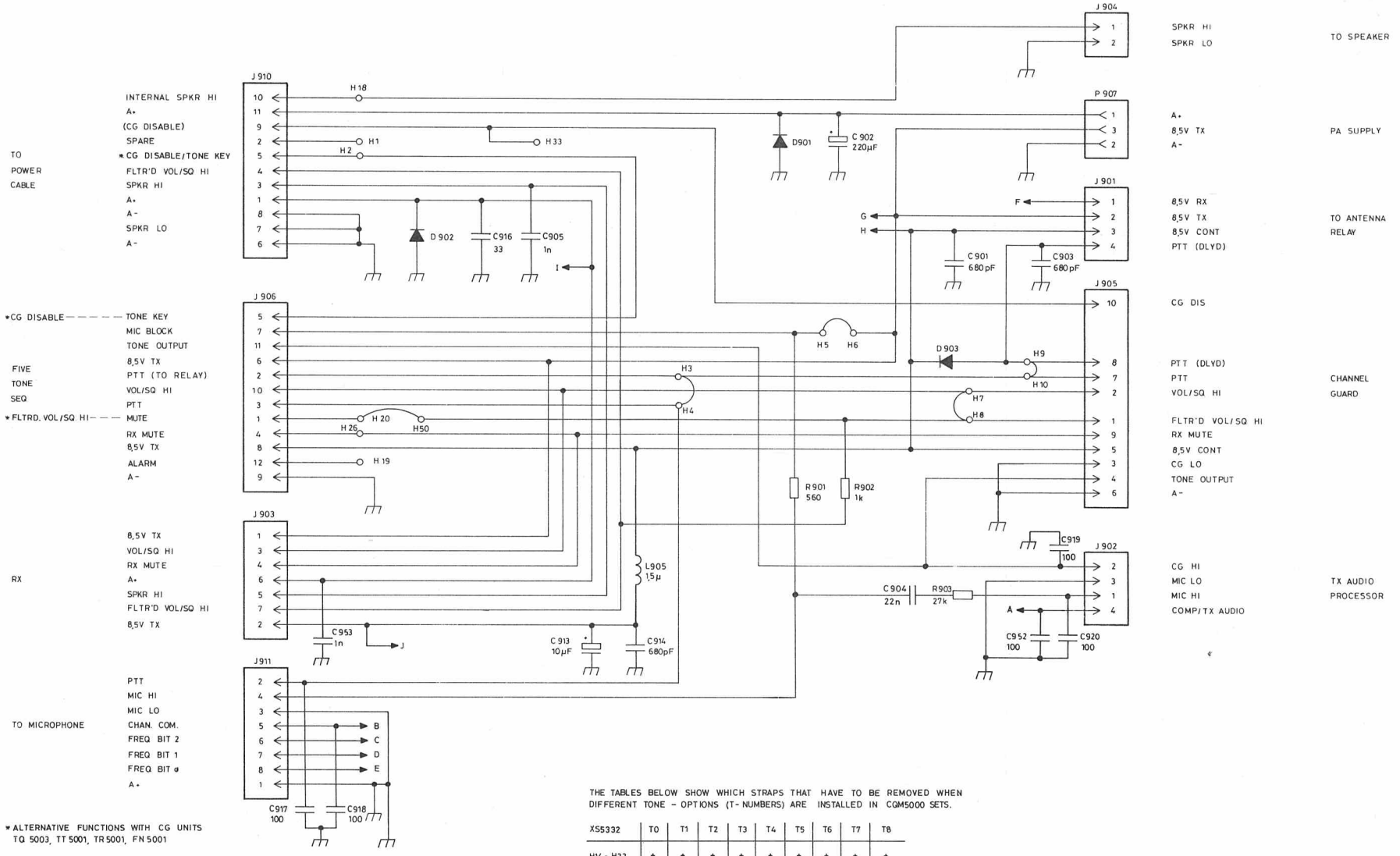
X402.779



CHANNEL SELECTOR UNIT XS 5332
OSCILLATOR SECTION

D402.770/2

Storno



* ALTERNATIVE FUNCTIONS WITH CG UNITS TQ 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 CQM5000 SETS.

XS5332	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H12 - H24	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H3 - H4	+	–	–	–	–	+	+	+	+
H5 - H6	+	–	–	–	–	+	+	+	+
H7 - H8	+	+	+	+	+	–	–	+	–
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	–	–	–	–	+	+	+	+

CHANNEL SELECTOR UNIT XS 5332

D402.772

TYPE	Nº	CODE	DATA	
	C901	74.5396	680pF 20% Ceramic DI	50V
	C901	74.5396	680pF 20% Ceramic DI	50V
	C902	73.5165	220uF -20 +100% Elco	25V
	C903	74.5396	680pF 20% Ceramic DI	50V
	C904	76.5141	22nF 5% Polyester FL	50V
	C905	74.5397	1nF 20% Ceramic DI	50V
	C905	74.5397	1nF 20% Ceramic DI	50V
	C906	74.5397	1nF 20% Ceramic DI	50V
	C907	74.5397	1nF 20% Ceramic DI	50V
	C908	74.5397	1nF 20% Ceramic DI	20%
	C909	74.5397	1nF 20% Ceramic DI	50V
	C910	73.5173	10uF 20% Tantal	16V
	C912	74.5395	470pF 20% Ceramic DI	50V
	C913	73.5173	10uF 20% Tantal	16V
	C914	74.5396	680pF 20% Ceramic DI	50V
	C915	74.5375	22pF 5% Ceramic DI	50V
	C916	74.5377	33pF 5% Ceramic DI	50V
	C917	74.5391	100pF 20% Ceramic DI	50V
	C918	74.5391	100pF 20% Ceramic DI	50V
	C919	74.5391	100pF 20% Ceramic DI	50V
	C920	74.5391	100pF 20% Ceramic DI	50V
	C921	74.5389	330pF 5% Ceramic DI	50V
	C921	74.5389	330pF 5% Ceramic DI	50V
	C922	74.5389	330pF 5% Ceramic DI	50V
	C923	74.5389	330pF 5% Ceramic DI	50V
	C924	74.5389	330pF 5% Ceramic DI	50V
	C924	74.5395	470pF 20% Ceramic DI	50V
	C925	74.5389	330pF 5% Ceramic DI	50V
	C926	74.5389	330pF 5% Ceramic DI	50V
	C927	74.5417	100pF 5% Ceramic DI	50V
	C927	74.5417	100pF 5% Ceramic DI	50V
	C928	74.5417	100pF 5% Ceramic DI	50V
	C929	74.5417	100pF 5% Ceramic DI	50V
	C930	74.5417	100pF 5% Ceramic DI	50V
	C931	74.5417	100pF 5% Ceramic DI	50V
	C932	74.5417	100pF 5% Ceramic DI	50V
	C933	74.5385	150pF 5% Ceramic DI	50V
	C933	74.5385	150pF 5% Ceramic DI	50V
	C934	74.5385	150pF 5% Ceramic DI	50V
	C935	74.5384	150pF 5% Ceramic DI	50V
	C936	74.5385	150pF 5% Ceramic DI	50V
	C937	74.5385	150pF 5% Ceramic DI	50V
	C938	74.5385	150pF 5% Ceramic DI	50V
	C939	74.5399	2.2nF 20% Ceramic DI	50V
	C939	74.5399	2.2nF 20% Ceramic DI	50V
	C940	74.5399	2.2nF 20% Ceramic DI	50V
	C941	74.5399	2.2nF 20% Ceramic DI	50V

TYPE	Nº	CODE	DATA	
	C942	74.5399	2.2nF 20% Ceramic DI	50V
	C943	74.5399	2.2nF 20% Ceramic DI	50V
	C944	74.5399	2.2nF 20% Ceramic DI	50V
	C945	74.5396	680pF 20% Ceramic DI	50V
	C946	74.5399	2.2nF 20% Ceramic DI	50V
	C947	74.5399	2.2nF 20% Ceramic DI	50V
	C948	74.5396	680pF 20% Ceramic DI	50V
	C949	73.5172	4.7uF 20% Tantal	35V
	C950	76.5135	10nF 10% Polyester FL	50V
	C951	74.5363	2,2pF 0.25pF Ceramic DI	50V
	C952	74.5391	100pF 20% Ceramic DI	50V
	C953	74.5397	1nF 20% Ceramic DI	50V
	C955	74.5395	470pF 20% Ceramic DI	50V
	C956	74.5395	470pF 20% Ceramic DI	50V
	C957	74.5395	470pF 20% Ceramic DI	50V
	C958	74.5395	470pF 20% Ceramic DI	50V
	C959	74.5395	470pF 20% Ceramic DI	50V
	C960	74.5395	470pF 20% Ceramic DI	50V
	C961	74.5386	180pF 5% Ceramic DI	50V
	C961	74.5386	180pF 5% Ceramic DI	50V
	C962	74.5386	180pF 5% Ceramic DI	50V
	C963	74.5386	180pF 5% Ceramic DI	50V
	C964	74.5386	180pF 5% Ceramic DI	50V
	C965	74.5386	180pF 5% Ceramic DI	50V
	C966	74.5386	180pF 5% Ceramic DI	50V
	C967	74.5403	18pF 5% Ceram DI	50V
	C967	74.5403	18pF 5% Ceramic DI	50V
	C968	74.5403	18pF 5% Ceramic DI	50V
	C969	74.5403	18pF 5% Ceramic DI	50V
	C970	74.5403	18pF 5% Ceramic DI	50V
	C971	74.5403	18pF 5% Ceramic DI	50V
	C971	74.5403	18pF 5% Ceramic DI	50V
	C973	74.5405	68pF 5% Ceramic DI	50V
	C973	74.5405	68pF 5% Ceramic DI	50V
	C974	74.5405	68pF 5% Ceramic DI	50V
	C975	74.5405	68pF 5% Ceramic DI	50V
	C976	74.5405	68pF 5% Ceramic DI	50V
	C977	74.5405	68pF 5% Ceramic DI	50V
	C978	74.5405	68pF 5% Ceramic DI	50V
	C979	74.5397	1nF 20% Ceramic DI	50V
	C980	74.5397	1nF 20% Ceramic DI	50V
	C981	74.5397	1nF 20% Ceramic DI	50V

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TYPE	Nº	CODE	DATA	
	C982	74.5397	1nF 20% Ceramic DI	50V
	C983	74.53.97	1nF 20% Ceramic DI	50V
	C984	74.5397	1nF 20% Ceramic DI	50V
	C985	74.5386	180pF 5% Ceramic DI	50V
	C986	74.5397	1nF 20% Ceramic DI	50V
	C987	74.5397	1nF 20% Ceramic DI	50V
	C988	74.5396	680pF 20% Ceramic DI	50V
	C989	73.5172	4.7uF 20% Tantal	35V
	C990	74.5395	470pF 20% Ceramic DI	50V
	C991	74.5263	2.2pF 0.25pF Ceramic DI	50V
	C992	74.5376	27pF 5% Ceramic DI	50V
	C993	74.5396	680pF 20% Ceramic DI	50V
	C994	74.5395	470pF 20% Ceramic DI	50V
	C995	74.5396	680pF 20% Ceramic DI	50V
	C996	74.5396	680pF 20% Ceramic DI	50V
	C997	74.5396	680pF 20% Ceramic DI	50V
	C998	74.5395	470pF 20% Ceramic DI	50V
	C999	74.5395	470pF 20% Ceramic DI	50V
	D901	99.5220	1N5401 Diode	
	D903	99.5237	1N4148 Diode	
	D904	99.5346	5.1V 5% Zenerdiode	0.4W
	D921	99.5373	Cap. diode	
	D921	99.5373	BB109G 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	4 pin
	J902	41.0228	Male connector	4 pin
	J903	41.0229	Male Connector	7 pin
	J904	41.0225	Male Connector	2 pin
	J905	41.0245	Male connector	10 pin
	J906	41.0227	Male connector	12 pin
	J907	41.5545	Fem. connector	3 pin
	J910	41.0232	Male cnnector	11 pin
	J911	41.0231	Male connector	8 pin
	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	1 pin
	P961	41.5550	Connector	1 pin
	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	1/8W
	R902	99.5220	1N5401 Diode	
	R903	80.5266	27Kohm 5% Carbon film	1/8W
	R904	80.5261	10Kohm 5% Carbon film	1/8W
	R905	80.5261	10Kohm 5% Carbon film	1/8W

CHANNEL SWITCH XS5332

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TYPE	Nº	CODE	DATA	
	R906	80.5261	10Kohm 5% Carbon film	1/8W
	R907	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	80.5252	1.8Kohm 5% Carbon film	1/8W
	R921	80.5252	1.8Kohm 5% Carbon film	1/8W
	R922	80.5252	1.8Kohm 5% Carbon film	1/8W
	R923	80.5252	1.8Kohm 5% Carbon film	1/8W
	R924	80.5252	1.8Kohm 5% Carbon film	1/8W
	R925	80.5252	1.8Kohm 5% Carbon film	1/8W
	R926	80.5249	1.8Kohm 5% Carbon film	1/8W
	R927	80.5269	47Kohm 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	80.5261	10Kohm 5% Carbon film	1/8W
	R934	80.5261	10Kohm 5% Carbon film	1/8W
	R935	80.5261	10Kohm 5% Carbon film	1/8W
	R936	80.5261	10Kohm 5% Carbon film	1/8W
	R937	80.5261	10Kohm 5% Carbon film	1/8W
	R938	80.5261	10Kohm 5% Carbon film	1/8W
	R939	80.5259	6.8Kohm 5% Carbon film	1/8W
	R940	80.5259	6.8Kohm 5% Carbon film	1/8W
	R941	80.5259	6.8Kohm 5% Carbon film	1/8W
	R942	80.5259	6.8Kohm 5% Carbon film	1/8W
	R943	80.5259	6.8Kohm 5% Carbon film	1/8W
	R944	80.5259	6.8Kohm 5% Carbon film	1/8W
	R945	80.5242	270ohm 5% Carbon film	1/8W
	R945	80.5242	270ohm 5% Carbon film	1/8W
	R946	80.5242	279ohm 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
	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

Storno

TYPE	Nº	CODE	DATA	
	R954	80.5259	6.8Kohm 5% Carbon film	1/8W
	R955	80.5235	68ohm 5% Carbon film	1/8W
	R956	86.5079	10Kohm 10% Trim Cermet	1/2W
	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
	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
	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
	R969	86.5079	10Kohm 10% Trim Cermet	1/2W
	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	80.5260	8.2Kohm 5% Carbon film	1/8W
	R980	80.5260	8.2Kohm 5% Carbon film	1/8W
	R981	80.5260	8.2Kohm 5% Carbon film	1/8W
	R982	80.5260	8.2Kohm 5% Carbon film	1/8W
	R983	80.5260	8.2Kohm 5% Carbon film	1/8W
	R984	80.5260	8.2Kohm 5% Carbon film	1/8W
	R985	80.5260	8.2Kohm 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

CHANNEL SWITCH XS5332

TYPE	Nº	CODE	DATA	
	R993	80.5242	270ohm 5% Carbon film	1/8W
	R994	80.5255	3.3Kohm 5% Carbon film	1/8W
	R995	80.5259	6.8Kohm 5% Carbon film	1/8W
	R996	80.5229	22ohm 5% Carbon film	1/8W
	R997	80.5251	1.5Kohm 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 Decoder	
	U902	14.5025	6405N Hex inverter	

Storno

TYPE	Nº	CODE	DATA

CHANNEL SWITCH XS5332

STORNOPHONE 5000
Maintenance Manual
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Storno

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: ±5kHz
CQM5663: ±4kHz

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
$-30^{o}C$ to $+ 60^{o}C$

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

Weight
1.8 Kg

RECEIVER

Sensitivity
12dB SINAD (EIA), ½e.m.f.
0.4uV (0.3uV)

Measuring conditions:
$\Delta f \pm 2/3 \times \Delta fmax$; f_{mod} = 1kHz

20dB SINAD (CEPT) e.m.f.
1.0uV (0.7uV)

ΔF 60% x $\Delta fmax$; f_{mod} = 1kHz.
Measured with psophometric filter.

Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

420 - 440MHz: $fx = \frac{Fs + 21.4}{9}$ MHz

440.025 - 449.975MHz: $fx = \frac{Fs \pm 21.4}{9}$ MHz

450 - 470MHz: $fx = \frac{Fs - 21.4}{9}$ 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)

TRANSMITTER

RF Power Output

CQM5660-5W: 5W

CQM5660-20W: 18W (20W)

R_L = 50 ohm

Crystal Frequency Range

46.5 - 52.4MHz

Crystal Frequency Calculation (fx)

$fx = \frac{Fs}{9}$

Storno

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 ±3dB
(60% ΔF 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%
Δf = ±3.0kHz

fm = 300Hz: max. 5%
Δf = ±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)

Storno

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
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 loudspeaker, when the microphone is lifted.

SU701 Transmitter keying switch for mounting on the steering coloum.

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)

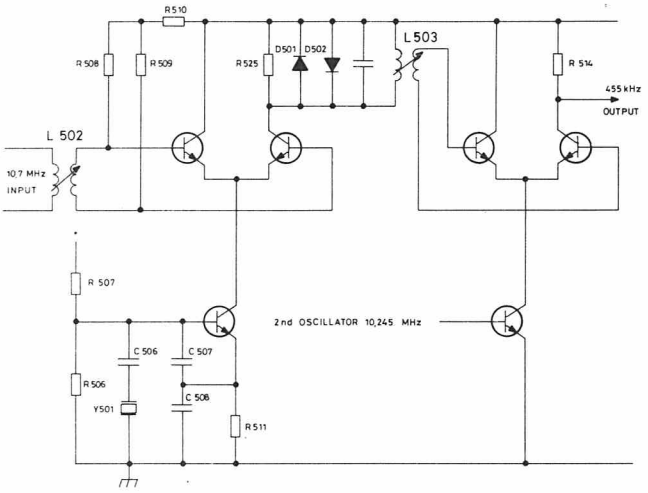
FRONT-END

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-stripline techniques on the mainboard.

Storno

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 guadrature 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 charateristics 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 deside 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 employes 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 potentio meter, 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 is two versions; one (XS5661) has space for accomodating 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_o 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 fusable printed wiring path which will open in case of the ground wire being accidently 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 monolitic 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.

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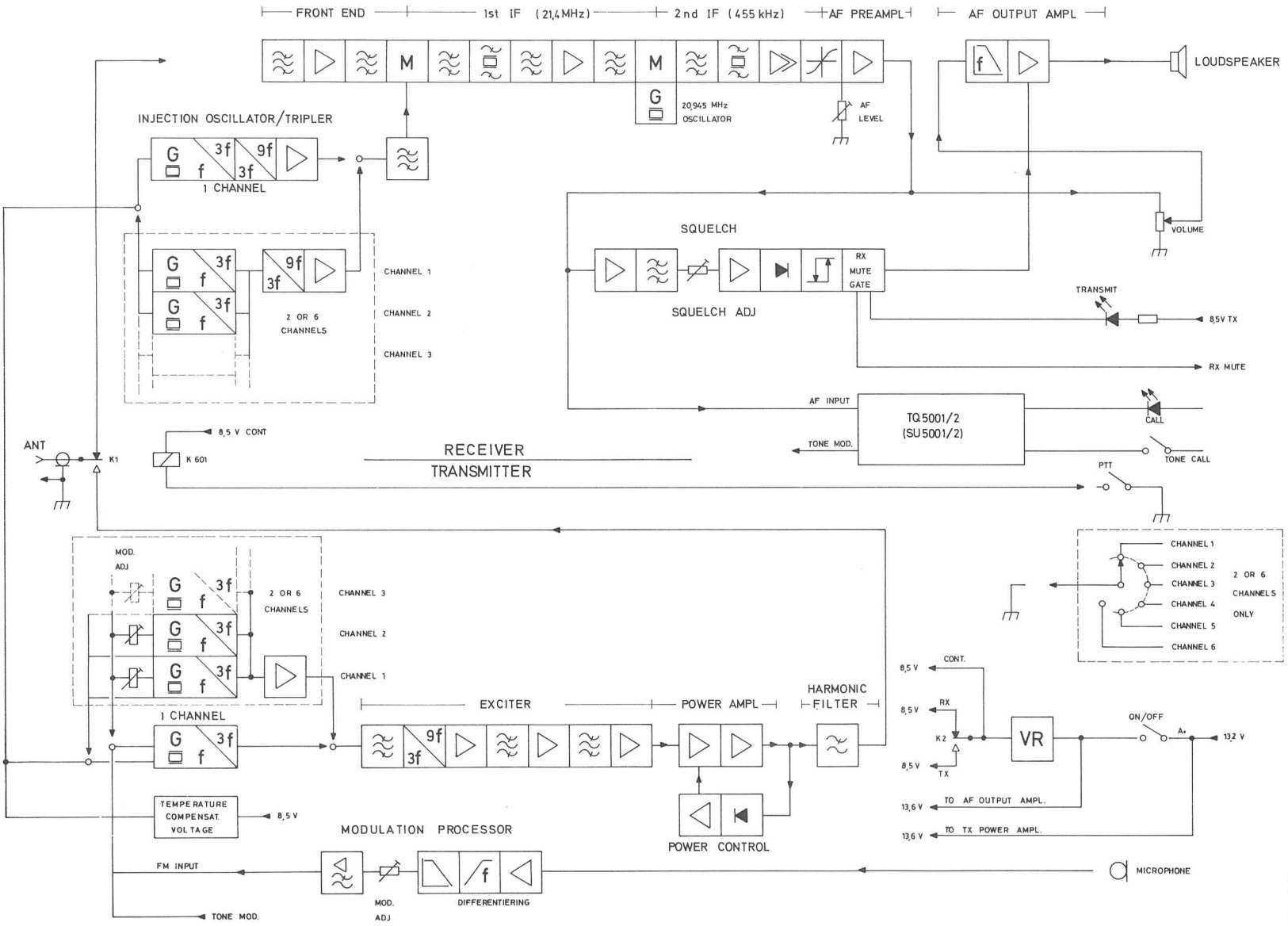


FUNCTIONAL BLOCK DIAGRAM
CQM 5660

D402.673

Storno

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$1Mohm
AC Voltmeter	Z_{in} >1Mohm//50pF
Multimeter	$R_i \geq$20Kohm/Volt
Distortion meter	e.g. Storno E11c
Psophometric filter	
RF Watt meter	25 W/50 ohm/420-470MHz
RF generator	Z_{out} = 50 ohm; 470-470MHz
21,4MHz signal gen.	Crystal controlled
Frequency counter with attenuator	Z_{in} = 50ohm; 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.

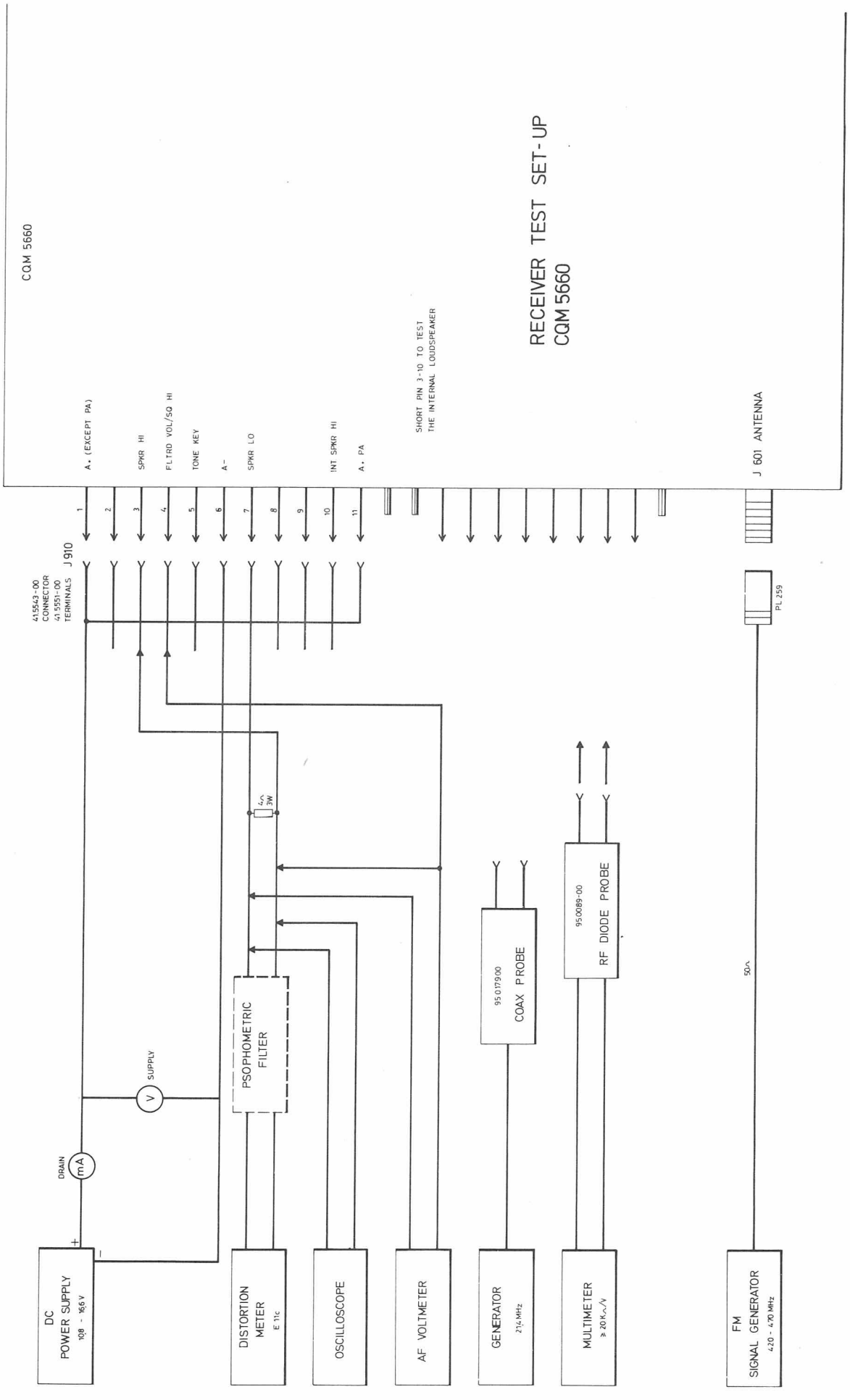
Checking 8.5 V regulated supply

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

Storno


RECEIVER TEST SET-UP
CQM 5660
CQM 5660
A+ (EXCEPT PA)
SPKR HI
FLTRD VOL/SQ HI
TONE KEY
A-
SPKR LO
INT SPKR HI
A+ PA
SHORT PIN 3-10 TO TEST
THE INTERNAL LOUDSPEAKER
J 601 ANTENNA
1
2
3
4
5
6
7
8
9
10
11
J 910
415543-00
CONNECTOR
415551-00
TERMINALS
PL 259
50Ω
4Ω
3W
SUPPLY
V
DRAIN
mA
PSOPHOMETRIC
FILTER
950179 00
COAX PROBE
950089-00
RF DIODE PROBE
DC
POWER SUPPLY
10.8 - 16.6 V
DISTORTION
METER
OSCILLOSCOPE
AF VOLTMETER
GENERATOR
MULTIMETER
≥ 20 KΩ/V
FM
SIGNAL GENERATOR
420 - 470 MHz

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 m V

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: $\geq$ 0.6V

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 futher 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 $F_{antenna}$ ±21.4MHz as follows:

420-440 MHz: $fx = \frac{Fs - 21.4}{9}$ MHz

440.025-449.975 MHz: $fx = \frac{Fs + 21.4}{9}$ MHz

450-470 MHz: $fx = \frac{Fs - 21.4}{9}$ MHz

Single channel sets

Adjust L301 for the specified frequency ($9 \times f_x$)
This adjustment shall be performed at 25°C
Requirement: F_{nom} ± 100Hz

Multichannel sets

Adjust the following coils on the XS board to the specified receiver frequencies (9 x tx)

L961, Channel 1
L962, Channel 2
L963, Channel 3
L964, Channel 4
L965, Channel 5
L966, Channel 6
Requirement: F_{nom} ± 100Hz

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.

Storno

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: ΔF = ±3kHz
CQM5663: ΔF = ±2.4kHz

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: 275mV ± 5mV.
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 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) 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 tilter, 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 immeadiately 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 x Δf max. The SINAD sensitivity is measured as a 12dB ratio between signal + noise + destortion 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: ≤ 1.0uV. 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: ≤0.4uV (½ 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, ΔF = 60% ΔF 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	

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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 multichannel 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.

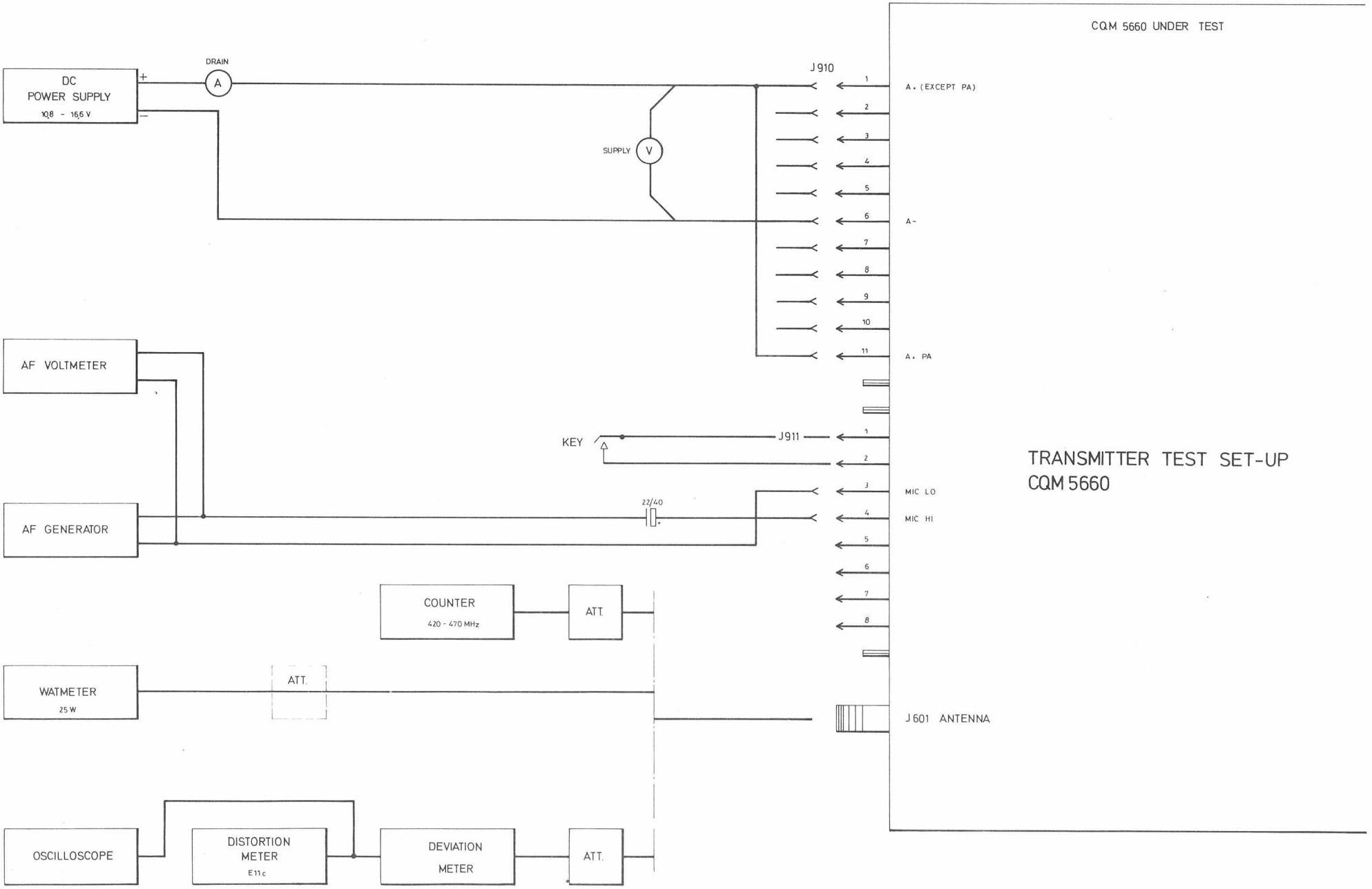
Single channel sets

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 is 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
DC
POWER SUPPLY
10,8 - 16,6 V
+
−
DRAIN
A
SUPPLY
V
J910
1
2
3
4
5
6
7
8
9
10
11
A. (EXCEPT PA)
A-
A. PA
AF VOLTMETER
AF GENERATOR
KEY
J911
1
2
22/40
3
4
5
6
7
8
MIC LO
MIC HI
COUNTER
420 - 470 MHz
ATT.
WATMETER
25 W
ATT.
J601 ANTENNA
OSCILLOSCOPE
DISTORTION
METER
E11c
DEVIATION
METER
ATT.
TRANSMITTER TEST SET-UP
CQM 5660

60.424-E1

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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 af $25^{o}C$.
Requirement: F_{nom} ±0.4 ppm. (180Hz at 450MHz)
ppm= parts per million= $x10^{-6}$

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} ± 0.1dB.
Measure the RF power output at 16.6V, 13.2V and 10.8V.
Requirements (20W):

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

Voltage	Power	Current
16.6V	5.0W (ref)	$\leq$ 2.6 A
13.2V	$\geq$ 4.5W	$\leq$ 2.6 A
10.8V	$\geq$ 4.2W	$\leq$ 2.6 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	± 5kHz
CQM5663	20kHz	± 4kHz

Requirement
Difference between + and - deviation: ≤ 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 : ± 3.0kHz
CQM5663 : ± 2.4kHz

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

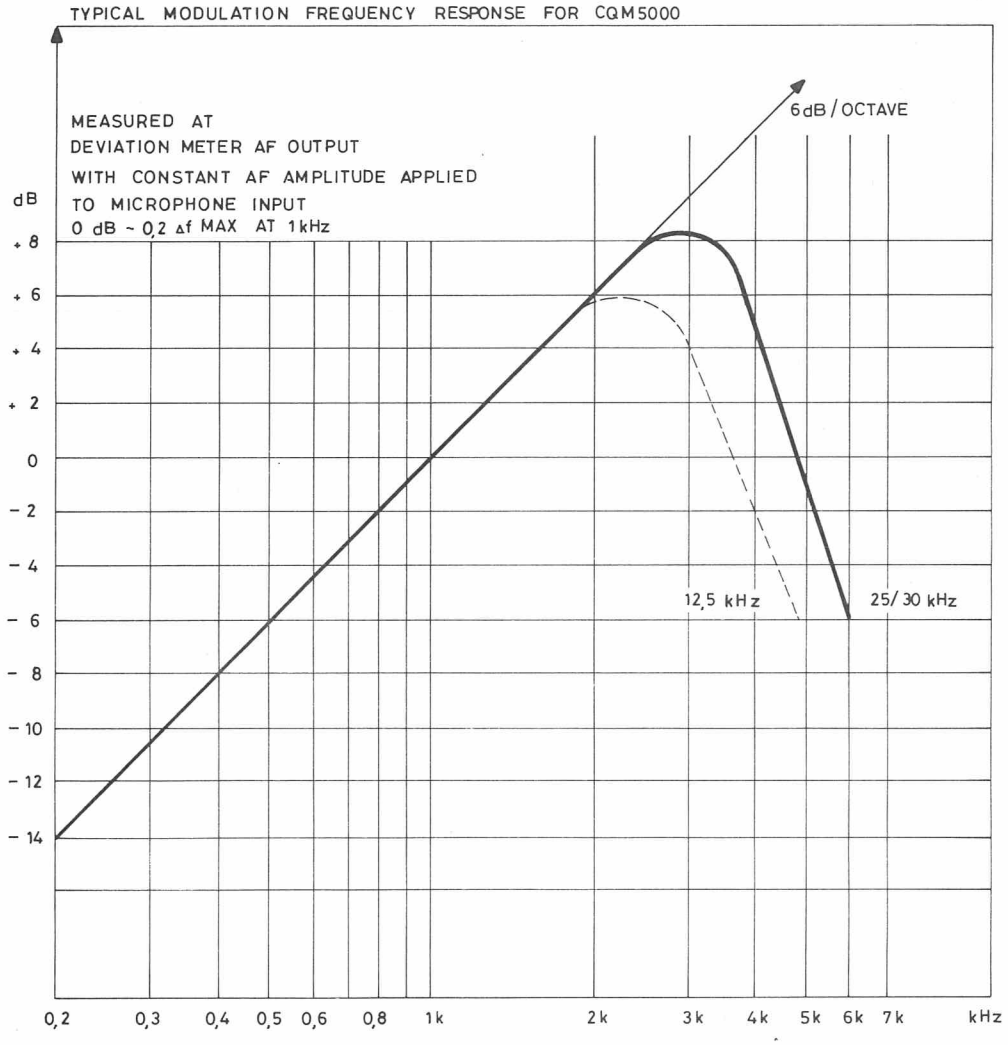
Requirements:
Modulating signal: 70mV ± 2dB
Distortion: ≤ 7%
(measured without de-emphasis)

Modulation frequency response
Set the AF generator to 1000Hz.
Reduce the AF generator output until a deviation of 0.2 x Δf max is obtained on the deviation meter.

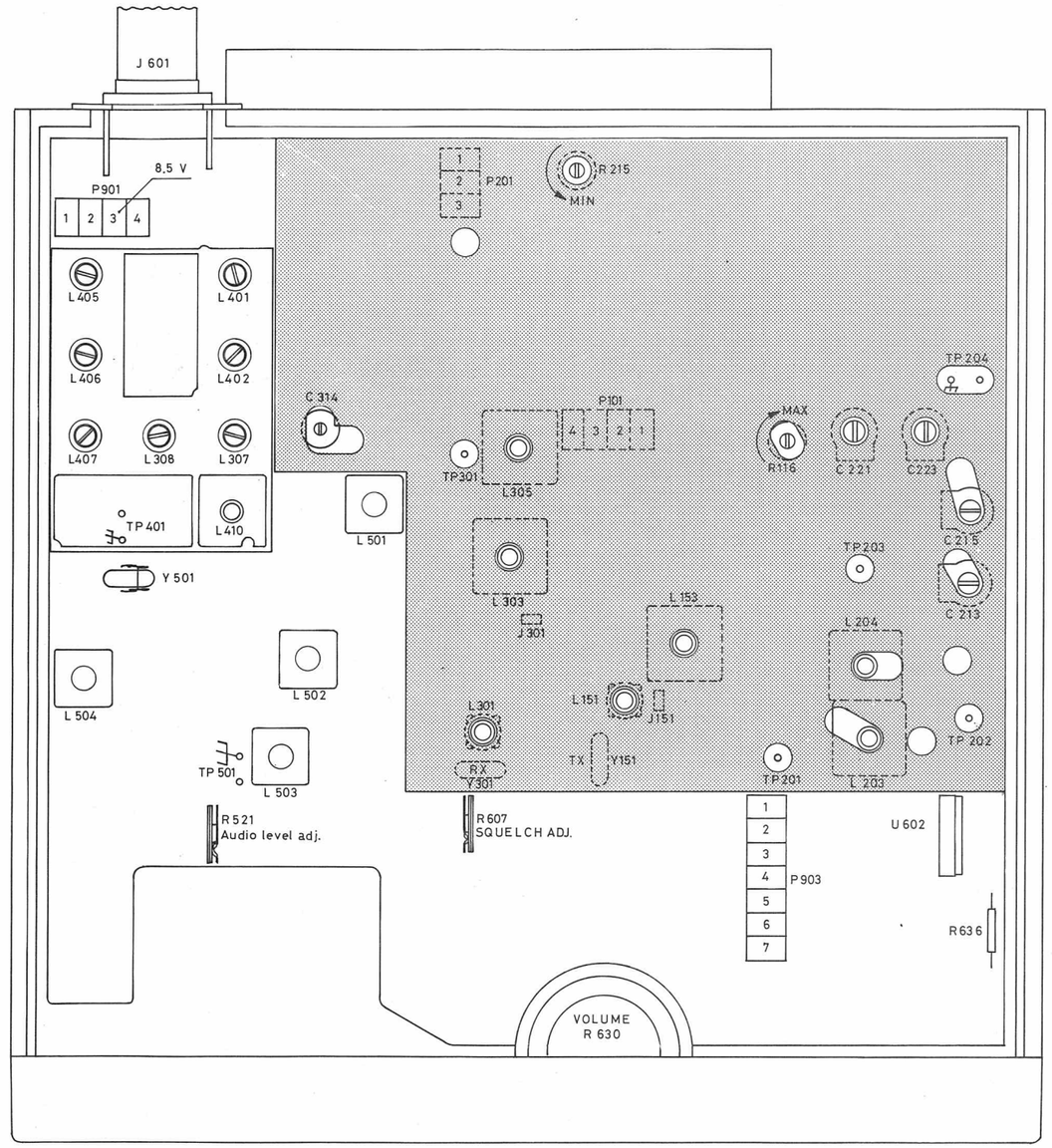
CQM5662 : ± 1.0kHz
CQM5663 : ± 0.8kHz

Vary the frequency of the generator and note the deviation changes as refered 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.

Storno


TYPICAL MODULATION FREQUENCY RESPONSE FOR CQM5000
MEASURED AT
DEVIATION METER AF OUTPUT
WITH CONSTANT AF AMPLITUDE APPLIED
TO MICROPHONE INPUT
0 dB ~ 0,2 Δf MAX AT 1kHz
6dB / OCTAVE
12,5 kHz
25/30 kHz
dB
+ 8
+ 6
+ 4
+ 2
0
- 2
- 4
- 6
- 8
- 10
- 12
- 14
0,2
0,3
0,4
0,5
0,6
0,8
1k
2k
3k
4k
5k
6k
7k
kHz

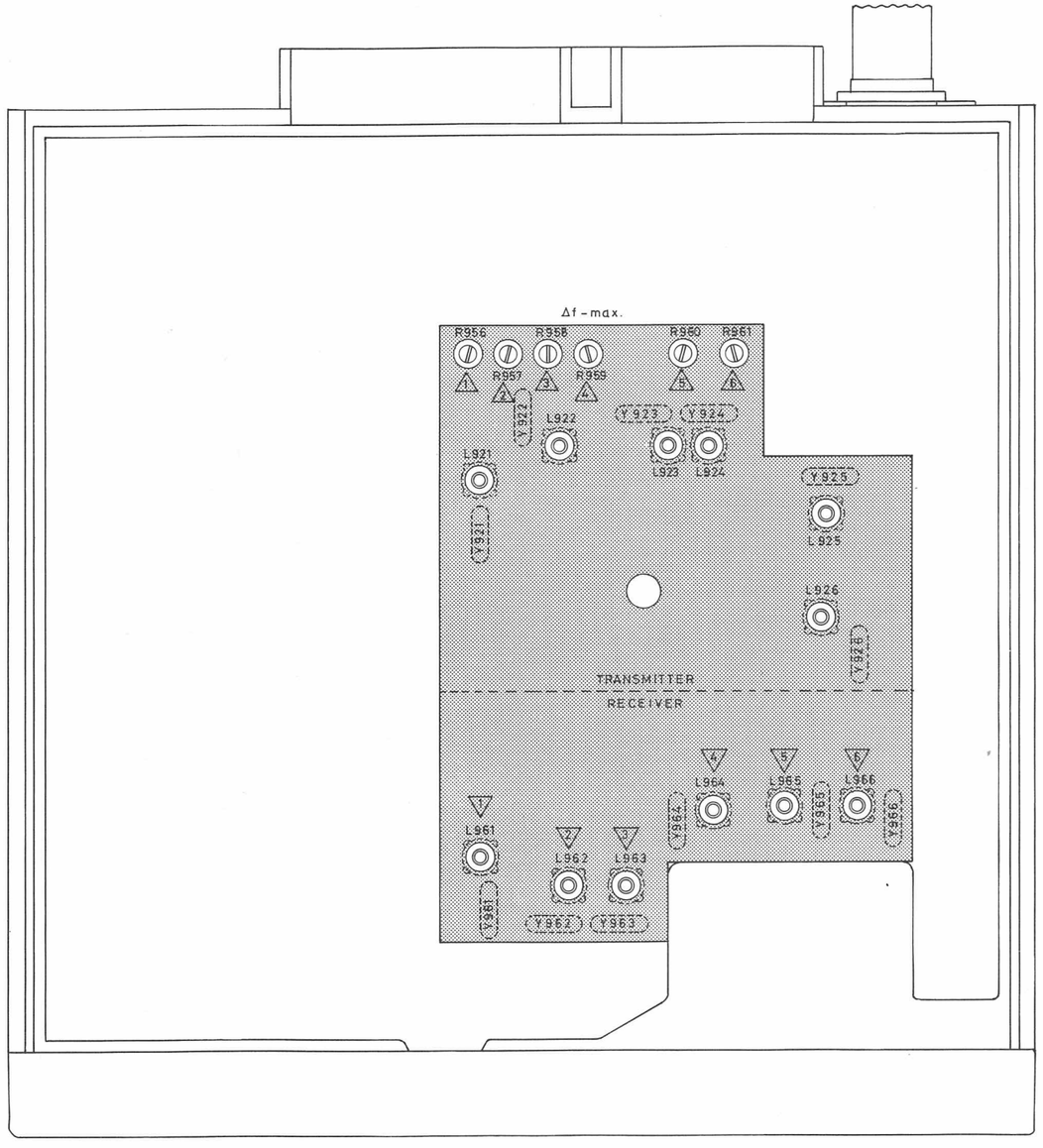
Storno



ADJUSTABLE COMPONENTS AND TEST POINTS ON RF5660 & RF5550

D402.672/2

Storno



▽ = RECEIVER CHANNEL №

△ = TRANSMITTER CHANNEL №

ADJUSTABLE COMPONENTS AND TEST POINTS ON XS5661/XS5662

D402.671

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

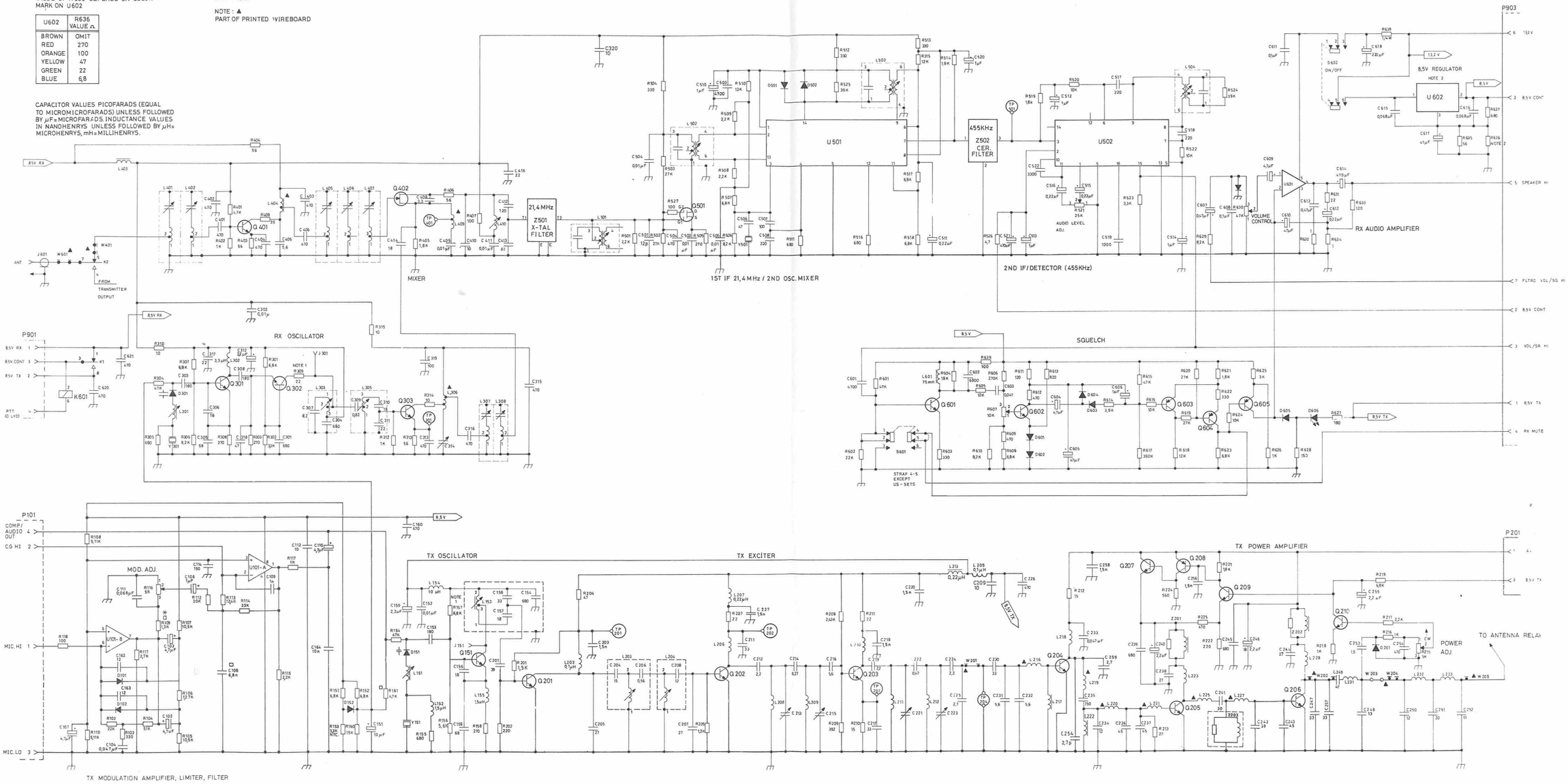
U602	R636 VALUE Ω
BROWN	OMIT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6,8

CAPACITOR VALUES PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY µF=MICROFARADS. INDUCTANCE VALUES IN NANOHENRYS UNLESS FOLLOWED BY µH= MICROHENRYS, mH=MILLIHENRYS.

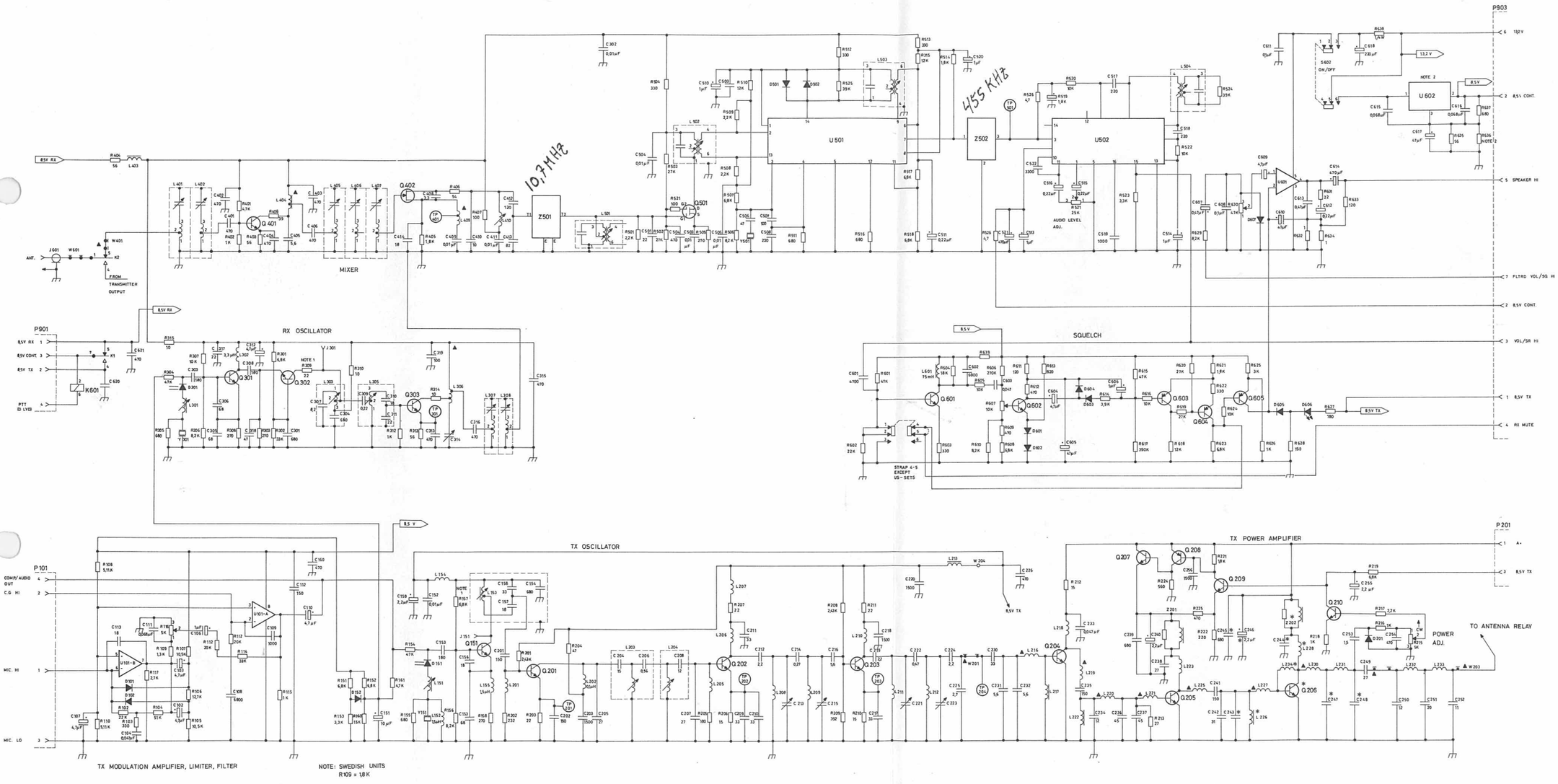
NOTE: ✱
R109 = 1,8K FOR SWEDEN

NOTE: □
12,5 KHz UNITS (RF 5664)
R109 = 1,8K
R161 = REMOVED
C108 = 10nF

NOTE: ▲
PART OF PRINTED WIREBOARD



RF UNIT RF 5660b
D403.206/3



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 ▲
BROWN	OMIT
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6,8

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	27 pF	—
C247	60 pF	—
C248	10 pF	8 pF
L226	63UH	—
L228	YES	—
L234		YES
Q206	YES	—
Z202	YES	—
C245	680pF	—
C246	2,2UF	—

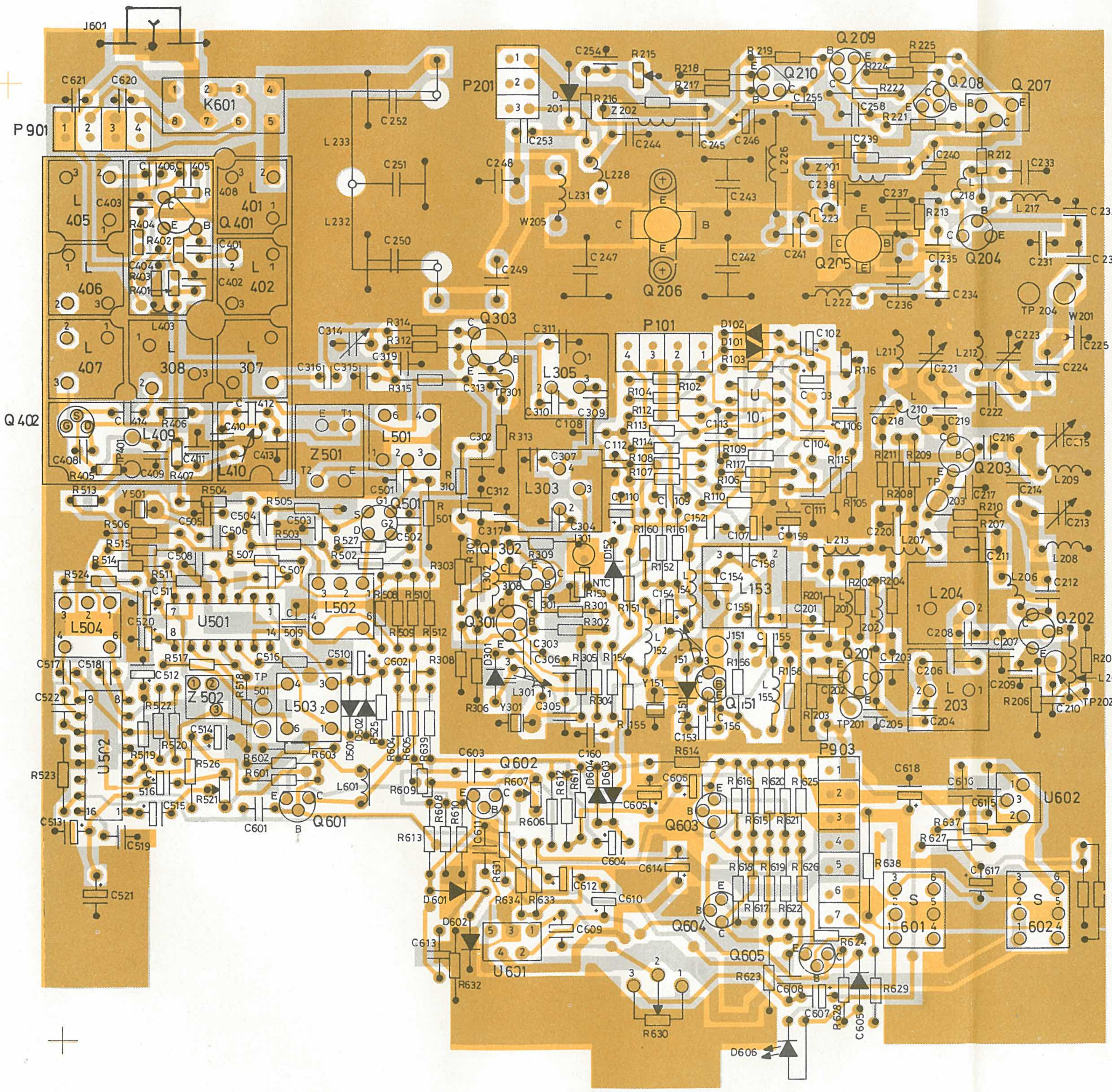
▲ PART OF PRINTED WIRE BOARD

RF UNIT RF5660
D402.652/2

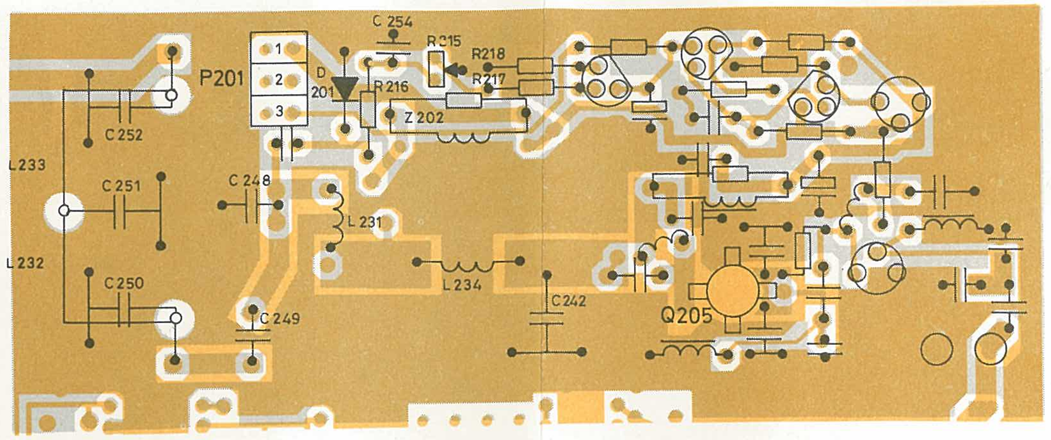
Storno

Storno

20 W



5 W



RF UNIT RF5660

D402.690

Storno

TYPE	Nº	CODE	DATA	
RF5664	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
	C108	76.5135	10 nF 5% Polyester FL	50V
	C109	76.5156	1nF 5% Polyester FL	50V
	C110	73.5172	4.7uF 20% Tantal	35V
	C111	76.5151	68nF 5% Polyester FL	63V
	C112	74.5371	10pF 20% Ceram DI	50V
	C114	74.5392	150 pF 20% Ceramic DI2	50 V
	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
	C162	74.5372	12pF 5% Ceram DI	50V
	C163	74.5372	12pF 5% Ceram DI	50V
	C164	76.5135	10nF 10% Polyester FL	50V
	C201	74.5378	39pF 5% Ceram DI	50V
	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	74.5371	10pF 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	2/10pF Air trimmer	250V
	C222	79.5004	0.47pF 5% Phenolic TB	500V
	C223	78.5065	2/10pF Air trimmer	250V

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TYPE	Nº	CODE	DATA	
	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
	C227	74.5398	1.5 nF 20% Ceramic 2DI	50 V
	C230	74.5377	33pF 5% Ceram DI	50V
	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	75.5025	30 pF 5% Teflon	250 V
	C242	75.5054	39 pF 5% Mica	250 V
	C243	75.5038	45 pF 5% Mica	250 V
	C244	74.5376	27 pF 5% Ceram DI	50 V
	C245	74.5396	680 pF 20% Ceram DI	50 V
	C246	J706339P2	2.2 uF 20% Tantal	35 V
	C247	75.5053	33 pF 5% Mica	250 V
	C248	75.5051	13 pF 5% Mica	250 V
	C249	75.5044	47 pF 2% Teflon	250 V
	C250	75.5034	12pF 0.5pF Teflon	250V
	C251	75.5036	20pF 0.5pF Teflon	250V
	C252	75.5035	11pF 0.5pF Teflon	250V
	C253	74.5361	1.5 pF 0.25 pF Ceram DI	50 V
	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
	C257	75.5053	33 pF 5% Mica	250 V
	C258	74.5398	1.5 nF 20% Ceramic 2DI	50 V
	C259	74.5364	2.7 pF 0.25 pF Ceram DI	50 V
	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

RF UNIT RF5660b

TYPE	Nº	CODE	DATA	
	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	18 pF 5% Ceram DI	50 V
	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
	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	100 pF 20% Ceramic DI	50 V
	C320	74.5371	10 pF 5% Ceram DI	50 V
	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	74.5384	120pF 5% Ceram DI	50V
	C413	74.5382	82pF 5% Ceram DI	50V
	C414	74.5374	18pF 5% Ceram DI	50V
	C416	74.5375	22 pF 5% Ceram DI	50 V
	C501	74.5372	12pF 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

Storno

TYPE	Nº	CODE	DATA	
	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
	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	99.5374	1N458A Diode, Select	
	D102	99.5374	1N458A Diode, Select	
	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
	D607	99.5237	1N4148 Diode	

RF UNIT RF5660b

TYPE	Nº	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	1.3 A
	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	Helecal 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	

Storno

TYPE	Nº	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
		28.0123	Tuning slug	
	P101	41.0238	Modified connector	
	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
	Q206	99.5375	RF Power transistor	23 W
	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	
J706011P2	= 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

TYPE	Nº	CODE	DATA	
	R109	89.5091	1.3Kohm 5% Carbon film	1/8W
RF5664	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
-5664	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	1/8 W
	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

Storno

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

X403.221/2

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	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
	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
	R638	80.5413	1ohm 5% Carbon film	1/4W
	R639	80.5237	100ohm 5% Carbon film	1/8W

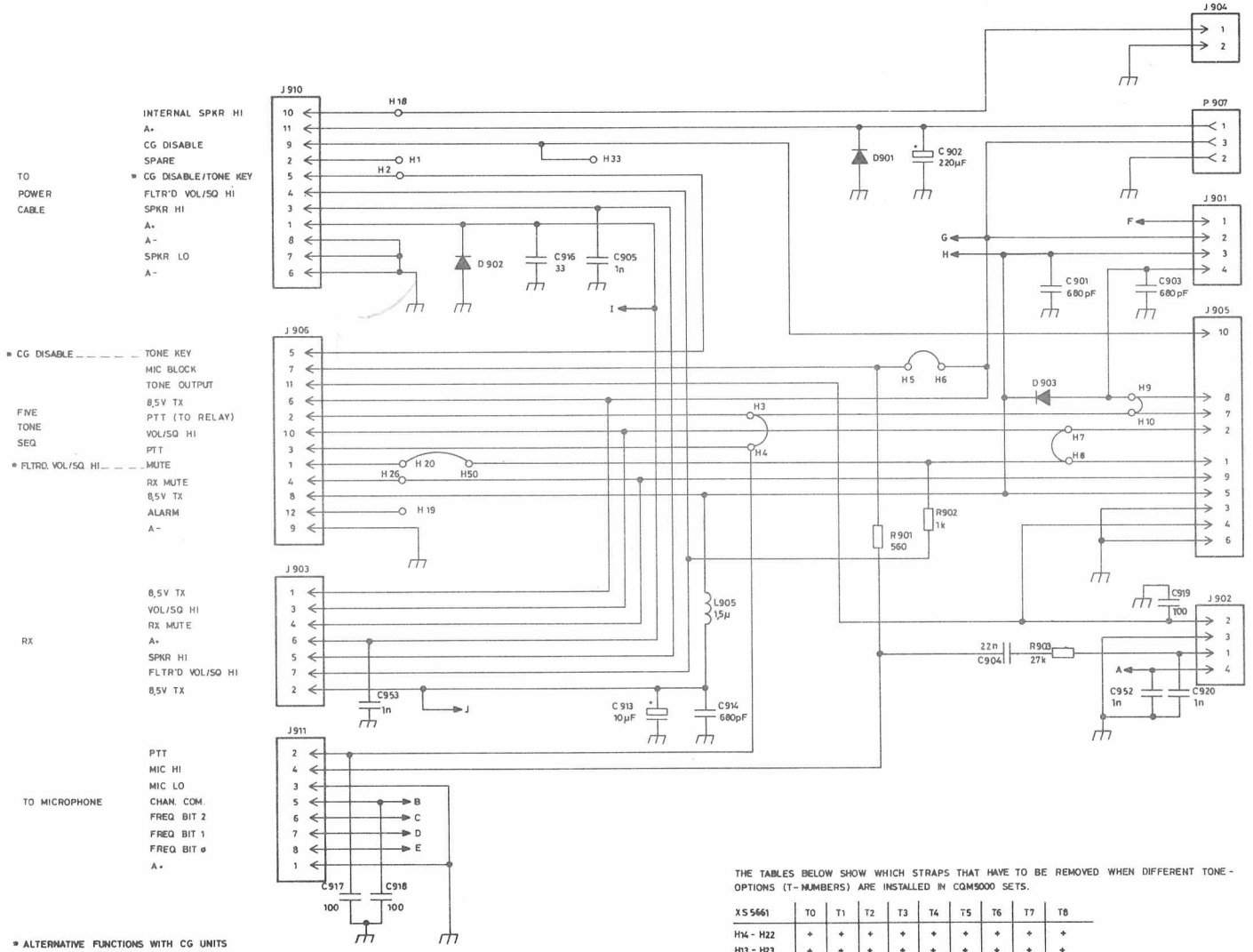
Storno

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	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	20.945 MHz
	Z201	61.1384	Damping choke	
	Z202	61.1384	Damping choke	
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
	Z203	A701092G1	Damping Choke	

RF UNIT RF5660b

Storno

Storno



* ALTERNATIVE FUNCTIONS WITH CG UNITS TQ 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 CQM5000 SETS.

XS 5661	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H32 - H29	+	+	+	+	+	+	+	+	+
H31 - H30	+	+	+	+	+	+	+	+	+
H3 - H4	+	–	–	–	–	+	+	+	+
H5 - H6	+	–	–	–	–	+	+	+	+
H7 - H8	+	+	+	+	+	–	–	+	–
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	–	–	–	–	+	+	+	+

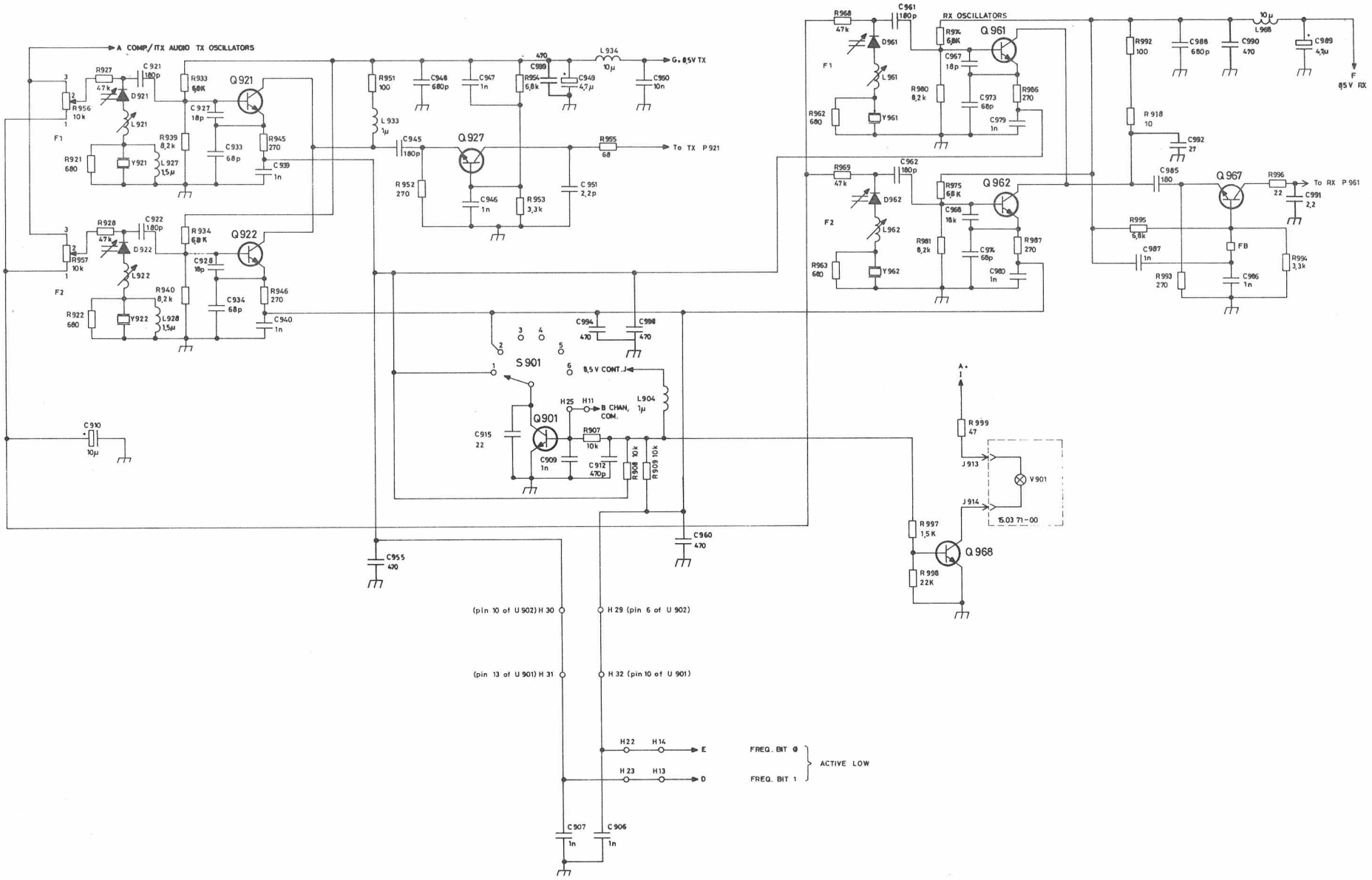
CHANNEL SELECTOR UNIT

XS 5661

D402.663

Storno

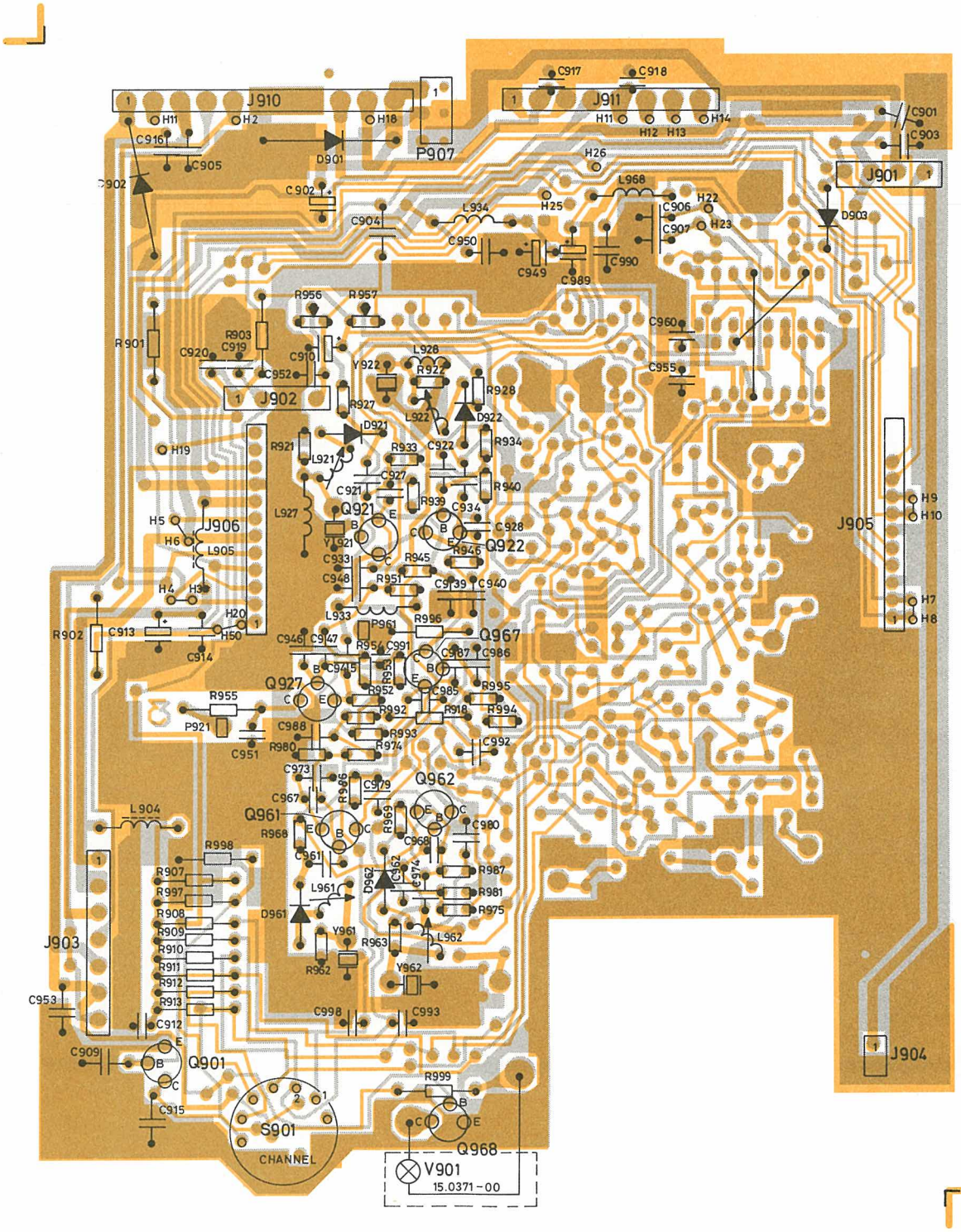
Storno



CHANNEL SELECTOR UNIT XS 5661
OSCILLATOR SECTION

D402.661

Storno



CHANNEL SELECTOR UNIT XS 5661

D402.694

Storno

TYPE	Nº	CODE	DATA	
	C901	74.5396	680pF 20% Ceramic DI	50V
	C902	73.5165	220uF -10%/+100% Elco	25V
	C903	74.5396	680pF 20% Ceramic DI	50V
	C904	76.5141	22nF 5% Polyester FL	50V
	C905	74.5397	1nF 20% Ceramic DI	50V
	C906	74.5397	1nF 20% Ceramic DI	50V
	C907	74.5397	1nF 20% Ceramic DI	50V
	C909	74.5397	1nF 20% Ceramic DI	50V
	C910	73.5173	10uF 20% Tantal	16V
	C912	74.5395	470pF 5% Ceramic DI	50V
	C913	73.5173	10uF 20% Tantal	16V
	C914	74.5396	680pF 20% Ceramic DI	50V
	C915	74.5375	22pF 5% Ceramic DI	50V
	C916	74.5377	33pF 5% Ceramic DI	50V
	C917	74.5391	100pF 20% Ceramic DI	50V
	C918	74.5391	100pF 20% Ceramic DI	50V
	C919	74.5391	100pF 20% Ceramic DI	50V
	C920	74.5391	100pF 20% Ceramic DI	50V
	C921	74.5386	180pF 5% Ceramic DI	50V
	C922	74.5386	180pF 5% Ceramic DI	50V
	C927	74.5403	18pF 5% Ceramic DI	50V
	C928	74.5403	18pF 5% Ceramic DI	50V
	C933	74.5405	68pF 5% Ceramic DI	50V
	C934	74.5405	68pF 5% Ceramic DI	50V
	C939	74.5397	1nF 20% Ceramic DI	50V
	C940	74.5397	1nF 20% Ceramic DI	50V
	C945	74.5386	180pF 5% Ceramic DI	50V
	C946	74.5397	1nF 20% Ceramic DI	50V
	C947	74.5397	1nF 20% Ceramic DI	50V
	C948	74.5396	680pF 20% Ceramic DI	50V
	C949	73.5172	4.7uF 20% Tantal	35V
	C950	76.5135	10nF 10% Polyester FL	50V
	C951	74.5363	2.2pF 0.25pF Ceramic D	150V
	C952	74.5391	100pF 20% Ceramic DI	50V
	C953	74.5397	1nF 20% Ceramic DI	50V
	C955	74.5395	470pF 5% Ceramic DI	50V
	C960	74.5395	470pF 5% Ceramic DI	50V
	C961	74.5386	180pF 5% Ceramic DI	50V
	C962	74.5386	180pF 5% Ceramic DI	50V
	C967	74.5403	18pF 5% Ceramic DI	50V
	C968	74.5403	18pF 5% Ceramic DI	50V
	C973	74.5405	68pF 5% Ceramic DI	50V
	C974	74.5405	68pF 5% Ceramic DI	50V
	C979	74.5397	1nF 20% Ceramic DI	50V
	C980	74.5397	1nF 20% Ceramic DI	50V
	C985	74.5386	180pF 5% Ceramic DI	50V
	C986	74.5397	1nF 20% Ceramic DI	50V
	C987	74.5397	1nF 20% Ceramic DI	50V

Storno

TYPE	Nº	CODE	DATA	
	C988	74.5396	680pF 20% Ceramic DI	50V
	C989	73.5172	4.7uF 20% Tantal	35V
	C990	74.5395	470pF 5% Ceramic DI	50V
	C991	74.5363	2.2pF 0.25pF Ceramic D	150V
	C992	74.5376	27pF 5% Ceramic	50V
	C994	74.5395	470pF 5% Ceramic DI	50V
	C998	74.5395	470pF 5% Ceramic DI	50V
	C999	74.5395	470pF 5% Ceramic DI	50V
	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	4 pin
	J902	41.0228	Male connector	4 pin
	J903	41.0229	Male connector	7 pin
	J904	41.0225	Male connector	2 pin
	J905	41.0245	Male connector	10 pin
	J906	41.0227	Male connector	12 pin
	J907	41.5545	Fem. connector	3 pin
	J910	41.0232	Male connector	11 pin
	J911	41.0231	Male connector	8 pin
	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

TYPE	Nº	CODE	DATA	
	Q962	99.5347	PN2369A Transistor	
	Q967	99.5347	PN2369A Transistor	
	Q968	99.5121	BC237 Transistor	
	R901	80.5246	560ohm 5% Carbon film	1/8W
	R902	80.5249	1Kohm 5% Carbon film	1/8W
	R903	80.5266	27Kohm 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
	R918	80.5225	10ohm 5% Carbon film	1/8W
	R921	80.5247	680ohm 5% Carbon film	1/8W
	R922	80.5247	680ohm 5% Carbon film	1/8W
	R927	80.5269	47Kohm 5% Carbon film	1/8W
	R928	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
	R939	80.5260	8.2Kohm 5% Carbon film	1/8W
	R940	80.5260	8.2Kohm 5% Carbon film	1/8W
	R945	80.5242	270ohm 5% Carbon film	1/8W
	R946	80.5242	270ohm 5% Carbon film	1/8W
	R951	80.5237	100ohm 5% Carbon film	1/8W
	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	80.5235	68ohm 5% Carbon film	1/8W
	R956	86.5079	10Kohm 10% Trim Cermet	1/2W
	R957	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
	R968	80.5269	47Kohm 5% Carbon film	1/8W
	R969	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
	R980	80.5260	8.2Kohm 5% Carbon film	1/8W
	R981	80.5260	8.2Kohm 5% Carbon film	1/8W
	R986	80.5242	270ohm 5% Carbon film	1/8W
	R987	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
	R994	80.5255	3.3Kohm 5% Carbon film	1/8W
	R995	80.5259	6.8Kohm 5% Carbon film	1/8W
	R996	80.5229	22ohm 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

Storno

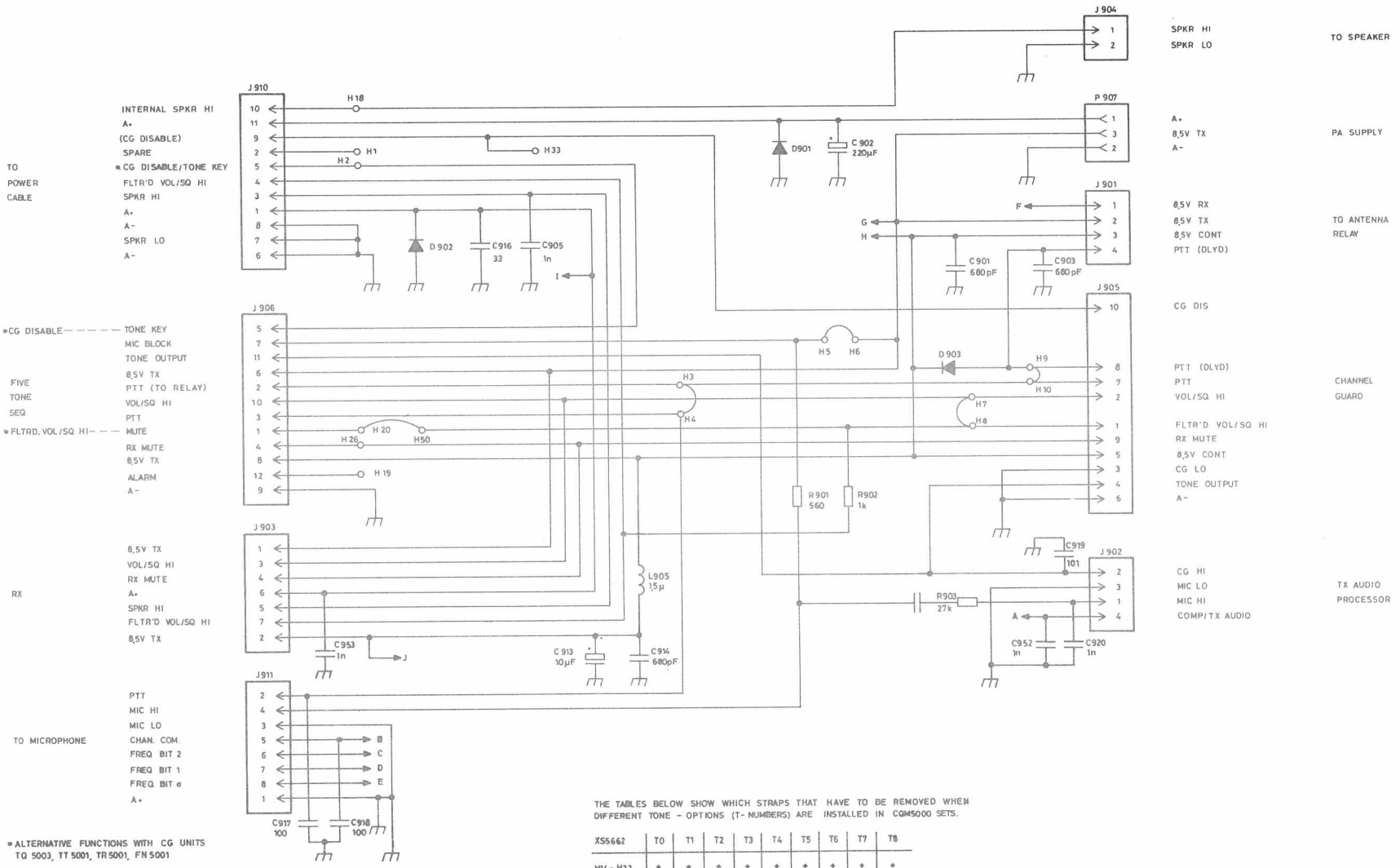
TYPE	Nº	CODE	DATA

CHANNEL SWITCH XS5661

X402.688

Storno

Storno



* ALTERNATIVE FUNCTIONS WITH CG UNITS TQ 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 CQM5000 SETS.

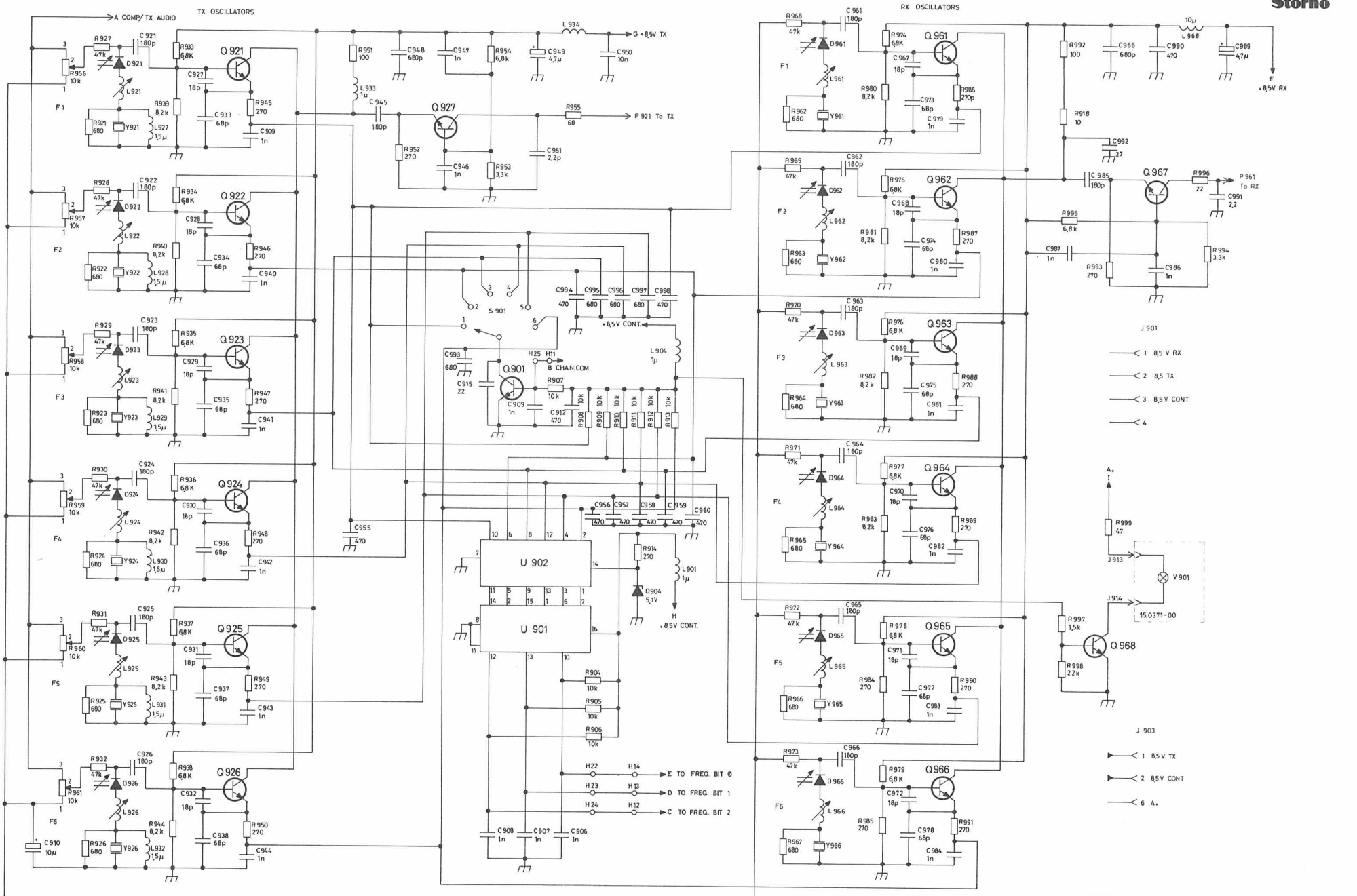
XS5662	T0	T1	T2	T3	T4	T5	T6	T7	T8
H14 - H22	+	+	+	+	+	+	+	+	+
H13 - H23	+	+	+	+	+	+	+	+	+
H12 - H24	+	+	+	+	+	+	+	+	+
H11 - H25	+	+	+	+	+	+	+	+	+
H3 - H4	+	–	–	–	–	+	+	+	+
H5 - H6	+	–	–	–	–	+	+	+	+
H7 - H8	+	+	+	+	+	–	–	+	–
H9 - H10	+	+	+	+	+	+	+	+	+
H20 - H50	+	–	–	–	–	+	+	+	+

CHANNEL SELECTOR UNIT
XS 5662

D402.664

Storno

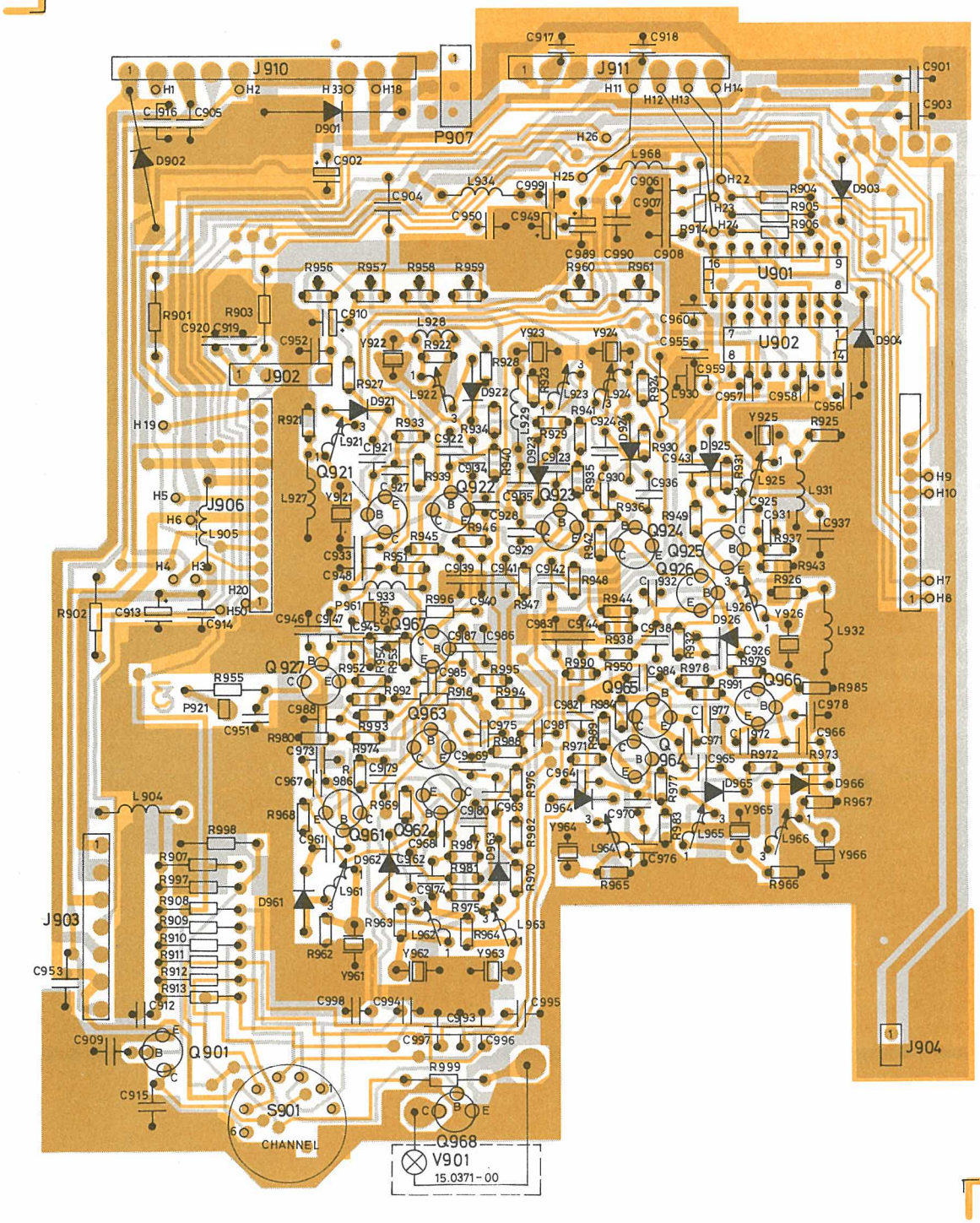
Storno



CHANNEL SELECTOR UNIT XS 5662
OSCILLATOR SECTION

D402.662/2

Storno



CHANNEL SELECTOR UNIT XS 5662

D402.691

Storno

TYPE	Nº	CODE	DATA	
	C901	74.5396	680pF 20% Ceramic DI	50V
	C902	73.5165	220uF -10%/+100% Elco	25V
	C903	74.5396	680pF 20% Ceramic DI	50V
	C904	76.5141	22nF 5% Polyester FL	50V
	C905	74.5397	1nF 20% Ceramic DI	50V
	C906	74.5397	1nF 20% Ceramic DI	50V
	C907	74.5397	1nF 20% Ceramic DI	50V
	C908	74.5397	1nF 20% Ceramic DI	50V
	C909	74.5397	1nF 20% Ceramic DI	50V
	C910	73.5173	10uF 20% Tantal	16V
	C912	74.5395	470pF 5% Ceramic DI	50V
	C913	73.5173	10uF 20% Tantal	16V
	C914	74.5396	680pF 20% Ceramic DI	50V
	C915	74.5375	22pF 5% Ceramic DI	50V
	C916	74.5377	33pF 5% Ceramic DI	50V
	C917	74.5391	100pF 20% Ceramic DI	50V
	C918	74.5391	100pF 20% Ceramic DI	50V
	C919	74.5391	100pF 20% Ceramic DI	50V
	C920	74.5391	100pF 20% Ceramic DI	50V
	C921	74.5386	180pF 5% Ceramic DI	50V
	C922	74.5386	180pF 5% Ceramic DI	50V
	C923	74.5386	180pF 5% Ceramic DI	50V
	C924	74.5386	180pF 5% Ceramic DI	50V
	C925	74.5386	180pF 5% Ceramic DI	50V
	C926	74.5386	180pF 5% Ceramic DI	50V
	C927	74.5403	18pF 5% Ceramic DI	50V
	C928	74.5403	18pF 5% Ceramic DI	50V
	C929	74.5403	18pF 5% Ceramic DI	50V
	C930	74.5403	18pF 5% Ceramic DI	50V
	C931	74.5403	18pF 5% Ceramic DI	50V
	C932	74.5403	18pF 5% Ceramic DI	50V
	C933	74.5405	68pF 5% Ceramic DI	50V
	C934	74.5405	68pF 5% Ceramic DI	50V
	C935	74.5405	68pF 5% Ceramic DI	50V
	C936	74.5405	68pF 5% Ceramic DI	50V
	C937	74.5405	68pF 5% Ceramic DI	50V
	C938	74.5405	68pF 5% Ceramic DI	50V
	C939	74.5397	1nF 20% Ceramic DI	50V
	C940	74.5397	1nF 20% Ceramic DI	50V
	C941	74.5397	1nF 20% Ceramic DI	50V
	C942	74.5397	1nF 20% Ceramic DI	50V
	C943	74.5397	1nF 20% Ceramic DI	50V
	C944	74.5397	1nF 20% Ceramic DI	50V
	C945	74.5386	180pF 5% Ceramic DI	50V
	C946	74.5397	1nF 20% Ceramic DI	50V
	C947	74.5397	1nF 20% Ceramic DI	50V
	C948	74.5396	680pF 20% Ceramic DI	50V
	C949	73.5172	4.7uF 20% Tantal	35V

Storno

TYPE	Nº	CODE	DATA	
	C950	76.5135	10nF 10% Polyester FL	50V
	C951	74.5363	2.2pF 0.25pF Ceramic D	150V
	C952	74.5391	100pF 20% Ceramic DI	50V
	C953	74.5397	1nF 20% Ceramic DI	50V
	C955	74.5395	470pF 5% Ceramic DI	50V
	C956	74.5395	470pF 5% Ceramic DI	50V
	C957	74.5395	470pF 5% Ceramic DI	50V
	C958	74.5395	470pF 5% Ceramic DI	50V
	C959	74.5395	470pF 5% Ceramic DI	50V
	C960	74.5395	470pF 5% Ceramic DI	50V
	C961	74.5386	180pF 5% Ceramic DI	50V
	C962	74.5386	180pF 5% Ceramic DI	50V
	C963	74.5386	180pF 5% Ceramic DI	50V
	C964	74.5386	180pF 5% Ceramic DI	50V
	C965	74.5386	180pF 5% Ceramic DI	50V
	C966	74.5386	180pF 5% Ceramic DI	50V
	C967	74.5403	18pF 5% Ceramic DI	50V
	C968	74.5403	18pF 5% Ceramic DI	50V
	C969	74.5403	18pF 5% Ceramic DI	50V
	C970	74.5403	18pF 5% Ceramic DI	50V
	C971	74.5403	18pF 5% Ceramic DI	50V
	C972	74.5403	18pF 5% Ceramic DI	50V
	C973	74.5405	68pF 5% Ceramic DI	50V
	C974	74.5405	68pF 5% Ceramic DI	50V
	C975	74.5405	68pF 5% Ceramic DI	50V
	C976	74.5405	68pF 5% Ceramic DI	50V
	C977	74.5405	68pF 5% Ceramic DI	50V
	C978	74.5405	68pF 5% Ceramic DI	50V
	C979	74.5397	1nF 20% Ceramic DI	50V
	C980	74.5397	1nF 20% Ceramic DI	50V
	C981	74.5397	1nF 20% Ceramic DI	50V
	C982	74.5397	1nF 20% Ceramic DI	50V
	C983	74.5397	1nF 20% Ceramic DI	50V
	C984	74.5397	1nF 20% Ceramic DI	50V
	C985	74.5386	180pF 5% Ceramic DI	50V
	C986	74.5397	1nF 20% Ceramic DI	50V
	C987	74.5397	1nF 20% Ceramic DI	50V
	C988	74.5396	680pF 20% Ceramic DI	50V
	C989	73.5172	4.7uF 20% Tantal	35V
	C990	74.5395	470pF 5% Ceramic DI	50V
	C991	74.5363	2.2pF 0.25pF Ceramic D	150V
	C992	74.5376	27pF 5% Ceramic	50V

CHANNEL SWITCH XS5662

X402.689

TYPE	Nº	CODE	DATA	
	C993	74.5396	680pF 20% Ceramic DI	50V
	C994	74.5395	470pF 5% Ceramic DI	50V
	C995	74.5396	680pF 20% Ceramic DI	50V
	C996	74.5396	680pF 20% Ceramic DI	50V
	C997	74.5396	680pF 20% Ceramic DI	50V
	C998	74.5395	470pF 5% Ceramic DI	50V
	C999	74.5395	470pF 5% Ceramic DI	50V
	D901	99.5220	1N5401 Diode	
	D902	99.5220	1N5401 Diode	
	D903	99.5237	1N4148 Diode	
	D904	99.5346	5.1V 5% Zenerdiode	0.4W
	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	
	D966	99.5341	Varicap	
	H901	92.5121	Lamp	
	J901	41.0228	Male connector	4 pin
	J902	41.0228	Male connector	4 pin
	J903	41.0229	Male connector	7 pin
	J904	41.0225	Male connector	2 pin
	J905	41.0245	Male connector	10 pin
	J906	41.0227	Male connector	12 pin
	J907	41.5545	Fem. connector	3 pin
	J910	41.0232	Male connector	11 pin
	J911	41.0231	Male connector	8 pin
	L901	61.5029	1uH RF choke	
	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	
	L923	61.5034	45-55MHz RF coil	
	L924	61.5034	45-55MHz RF coil	
	L925	61.5034	45-55MHz RF coil	
	L926	61.5034	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	

Storno

TYPE	Nº	CODE	DATA	
	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	
	L963	61.5034	45-55MHz RF coil	
	L964	61.5034	45-55MHz RF coil	
	L965	61.5034	45-55MHz RF coil	
	L966	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	
	Q923	99.5347	PN2369A Transistor	
	Q924	99.5347	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	PN2369A Transistor	
	Q966	99.5347	PN2369A Transistor	
	Q967	99.5347	PN2369A Transistor	
	Q968	99.5121	BC237 Transistor	
	R901	80.5246	560ohm 5% Carbon film	1/8W
	R902	80.5249	1Kohm 5% Carbon film	1/8W
	R903	80.5266	27Kohm 5% Carbon film	1/8W
	R904	80.5261	10Kohm 5% Carbon film	1/8W
	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

CHANNEL SWITCH XS5662

X402.689

TYPE	Nº	CODE	DATA	
	R921	80.5247	680ohm 5% Carbon film	1/8W
	R922	80.5247	680ohm 5% Carbon film	1/8W
	R923	80.5247	680ohm 5% Carbon film	1/8W
	R924	80.5247	680ohm 5% Carbon film	1/8W
	R925	80.5247	680ohm 5% Carbon film	1/8W
	R926	80.5247	680ohm 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	80.5260	8.2Kohm 5% Carbon film	1/8W
	R940	80.5260	8.2Kohm 5% Carbon film	1/8W
	R941	80.5260	8.2Kohm 5% Carbon film	1/8W
	R942	80.5260	8.2Kohm 5% Carbon film	1/8W
	R943	80.5260	8.2Kohm 5% Carbon film	1/8W
	R944	80.5260	8.2Kohm 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
	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	80.5235	68ohm 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

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TYPE	Nº	CODE	DATA	
	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	80.5260	8.2Kohm 5% Carbon film	1/8W
	R981	80.5260	8.2Kohm 5% Carbon film	1/8W
	R982	80.5260	8.2Kohm 5% Carbon film	1/8W
	R983	80.5260	8.2Kohm 5% Carbon film	1/8W
	R984	80.5260	8.2Kohm 5% Carbon film	1/8W
	R985	80.5260	8.2Kohm 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
	R994	80.5255	3.3Kohm 5% Carbon film	1/8W
	R995	80.5259	6.8Kohm 5% Carbon film	1/8W
	R996	80.5229	22ohm 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 BCD/DEC decoder	
	U902	14.5025	6405N Hex. inverter O.C.	

CHANNEL SWITCH XS5662

X402.689

STORNOPHONE 5000
Maintenance Manual
Section 10

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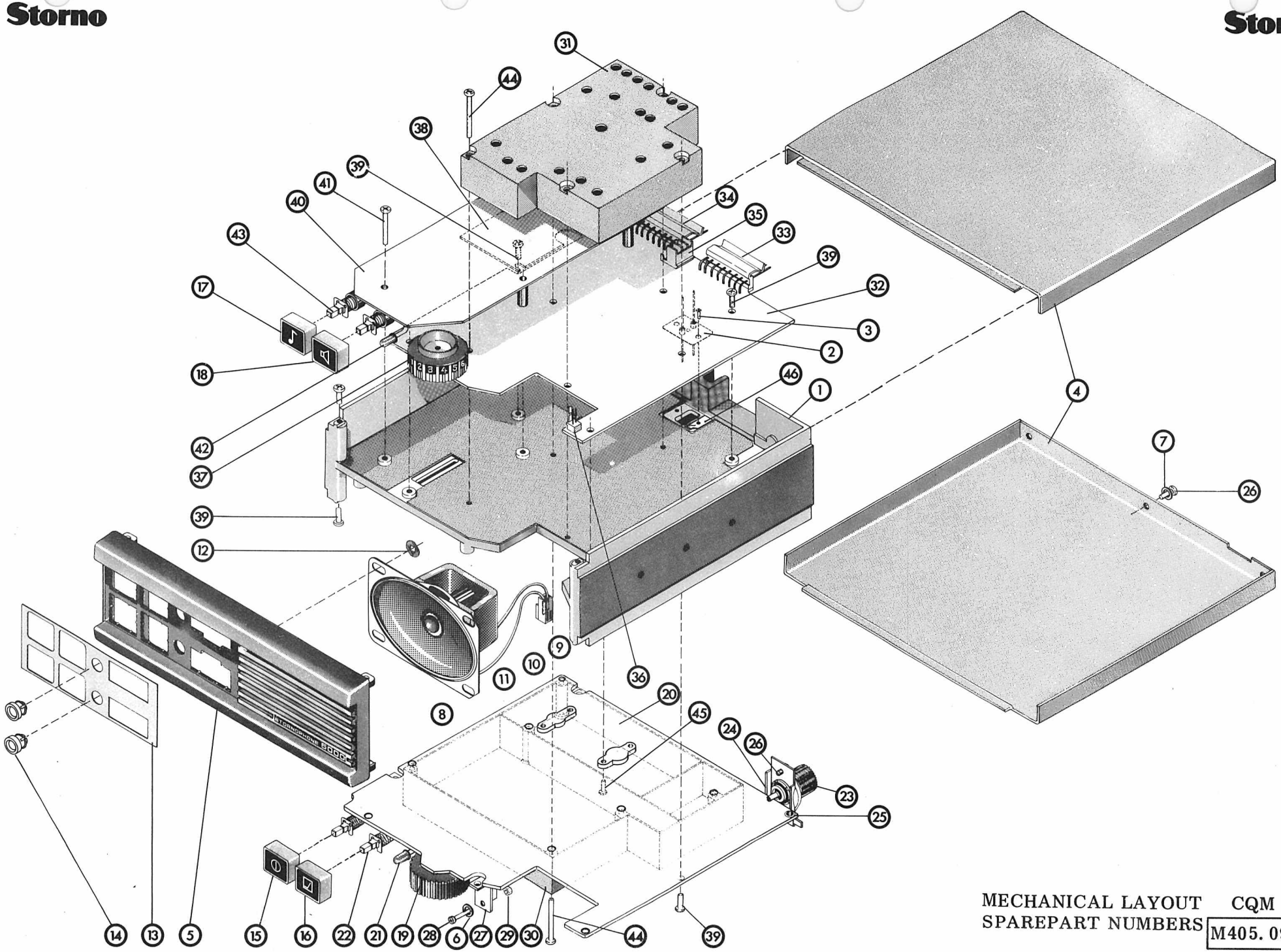

MECHANICAL LAYOUT CQM 5000
SPAREPART NUMBERS M405. 096/1

ITEM	CODE	DESCRIPTION
1	10.3742-00	Cabinet Coffret
2	69.0016-00	Feed through connector Connecteur d'alimentation
3	20022-02003	Screw M2x3mm Vis M2x3mm
4	11.1177-00	Cover Couvercle
5	15.0379-00	Front cap Eur. Avant Europ.
	15.0380-00	Front cap U.S. Avant Américc
6	2450-048027	Spring washer Rondelle grower
7	2450-06032	Spring washer Rondelle grower
8	97.0018-00	Loudspeaker modified Haut-parleur modifié
9	41.5546-00	Connector housing female Prise femelle pour connecteur
10	41.5547-00	Crimp terminal for connector Embout pour connecteur
11	173.5203-00	Wire for loudspeaker Fil du H.P.
12	2453-102040	Speed nut Ecrou
		Item No. 5 to 12 are assembled under one code No. 10.3740-00 for Eur. and 10.3741 for U.S. l'ensemble des pièces 5 à 12 a le numéro 10.3740-00 (europ.) l'ensemble des pièces 5 à 12 a le numero 10.3741 (américc.)
	51.1160-00	Nameplate
	51.1161-00	Nameplate Eur. Version
	51.1164-00	Nameplate Plaque europ.
	51.1165-00	Nameplate
13		
	51.1169-00	Nameplate
	51.1170-00	Nameplate U.S. version
	51.1173-00	Nameplate Plaque américc.
	51.1174-00	Nameplate
14	32.0512-00	Bushing for led indicator Voyant pour diode lumineuse
15	490271-00	Push button(on/off) Eur. Bouton marche/arrêt europ.
	49.0275-00	Push button(on/off) U.S. Bouton marche/arrêt américc.

ITEM	CODE	DESCRIPTION
16	490272-00	Push button (SQ) Eur. Bouton de squelch europ.
	49.0276-00	Push button (SQ) U.S. Bouton de squelch américc.
17	49.0273-00	Push button (tone key) Eur. Bouton de tonalité europ.
	49.0277-00	Push button (tone key) U.S. Bouton de tonalité américc.
18	49.0274-00	Push button (LS. in/out) Eur. Bouton de H.P. europ.
	49.0278-00	Push button (LS. in/out) U.S. Bouton de H.P. américc.
19	49.0267-00	Knob volume control Eur. Bouton de volume europ.
	49.0281-00	Knob volume control U.S. Bouton de volume américc.
		Item No. 13 to 19 are available as a Kit for name plate. At ordering of Kit or single item see choice sheet No. M405.096-4 Les pièces 13 à 19 peuvent être commandées ensemble. Voir choice sheet M405.096-4
20	10.3732-00	RF 5112-6/10 WATT
	10.3733-00	RF 5112-25 WATT
	10.3734-00	RF 5113-6/10 WATT
	10.3776-00	RF 5113-25 WATT
	10.3735-00	RF 5114-6/10 WATT
	10.3736-00	RF 5114-25 WATT
21	99.5303-00	Light emitt. diode red Diode lumineuse rouge
22	470641-00	Switch Commutateur
23	41.5165-00	Connector UHF Connecteur UHF
24	33.0406-00	Braket Applique
25	305023-00	Tubular rivet Rivet tubulaire
26	20022-03005	Screw M3x5 Vis M3x5
27	59.0049-00	Heat sink Radiateur
28	20022.02508	Screw M2,5x8 Vis M2,5x8
29	2202-025050	Nut M2,5 Ecrou M2,5
		Item No. 20 is fully assembled circuit including item No. 21 to 29. 20 complétement assemblé contient les pièces 21 à 29.

ITEM	CODE	DESCRIPTION
30	12.0357-01	Shield Eur. Ecran europ.
	12.0400-00	Shield U.S. Ecran américain.
31	12.0361-00	Shield Multifreq. Ecran multifreq.
	10.3737-00	Channel selector unit XS5001
32	10.3738-00	Channel selector unit XS5002
	10.3739-00	Channel selector unit XS5003 Sélecteur de canal XS5001, XS5002, XS5003
33	41.0231-00	Connector 8 pos. male Connecteur mâle 8 pos.
34	41.0232-00	Connector 11 pos. male Connecteur mâle 11 pos.
35	41.5545-00	Connector 3 pos. female Connecteur femelle 3 pos.
36	41.0225-00	Connector 2 pos. male Connecteur mâle 2 pos.
37	49.0268-00	Knob channel switch (only XS5002 and XS5003) Bouton de sélecteur de canal (pour XS5002 et XS5003 seul)
		Item No. 32 is fully assembled circuit including item No. 33 to 37. 32 complètement assemblé contient les pièces 33 à 37.
38	10.3745-00	Switching unit SU5001
	10.3746-00	Switching unit SU5002
39	20562-03008	Screw M3x8 mm Vis M3x8 mm
	10.3743-00	Tone transmitter/receiver TQ5001 Emetteur-récepteur de tonalité TQ5001
40	10.3744-00	Tone transmitter/receiver TQ5002 Emetteur-récepteur de tonalité TQ5002
41	20562-03022	Screw M3x22 mm Vis M3x22 mm
42	99.5325-00	L.E.D. Yellow Diode lumineuse jaune
43	47.0642-00	Switch Commutateur
		Item No. 40 is fully assembled circuit including item No. 41 to 43. 40 complètement assemblé contient les pièces 41 à 43.
44	20562-03028	Screw M3x28 mm Vis M3x28 mm
45	20022-02508	Screw M2,5x8 mm Vis M2,5x8 mm
46	36.0298-00	Plate, grounding spring Plaque à ressort de mise à la terre

Storno

* ONE CHANNEL ** MORE THAN ONE CHANNEL

Storno

CQM 5000 TONE EQUIPMENT T. No.	KIT WITH NAMEPLATE AND BUTTON				NAME PLATE Eur.				NAME PLATE US.				BUSHING Eur. & US. 32.0512-00	KNOB VOL. 49.0267-00Eur. 49.0281-00 US.	PUSH BUTTON			
	ONE CHANNEL		MORE THAN ONE CHANNEL												ON/OFF	SQ.	TONE KEY	LS. IN/OUT
	17.0116-00Eur. 17.0122-00 US.	17.0120-00Eur. 17.0126-00 US.	17.0117-00Eur 17.0123-00 US.	17.0121-00Eur. 17.0127-00 US.	* 51.1160-00	* 51.1164-00	** 51.1161-00	** 51.1165-00	* 51.1169-00	* 51.1173-00	** 51.1170-00	** 51.1174-00			49.0271-00Eur. 49.0275-00 US.	49.0272-00Eur 49.0276-00 US.	49.0273-00Eur. 49.0277-00 US.	49.0274-00Eur 49.0278-00 US.
T 0	1		1		1		1		1		1		1	1	1	1		
T 1		1		1		1		1		1		1	2	1	1	1	1	1
T 2		1		1		1		1		1		1	2	1	1	1	1	1
T 3		1		1		1		1		1		1	2	1	1	1	1	1
T 4		1		1		1		1		1		1	2	1	1	1	1	1
T 5	1		1		1		1		1		1		1	1	1	1		
T 6	1		1		1		1		1		1		1	1	1	1		
T 7	1		1		1		1		1		1		1	1	1	1		
T 8	1		1		1		1		1		1		1	1	1	1		
T 9		1		1		1		1		1		1	2	1	1	1	1	1
T 10		1		1		1		1		1		1	2	1	1	1	1	1
T 11		1		1		1		1		1		1	2	1	1	1	1	1
T 12		1		1		1		1		1		1	2	1	1	1	1	1
T 13		1		1		1		1		1		1	2	1	1	1	1	1
T 14		1		1		1		1		1		1	2	1	1	1	1	1
T 15		1		1		1		1		1		1	2	1	1	1	1	1
T 16		1		1		1		1		1		1	2	1	1	1	1	1
T 17		1		1		1		1		1		1	2	1	1	1	1	1
T 18		1		1		1		1		1		1	2	1	1	1	1	1
T 19		1		1		1		1		1		1	2	1	1	1	1	1
T 20		1		1		1		1		1		1	2	1	1	1	1	1
T 21		1		1		1		1		1		1	2	1	1	1	1	1
T 22		1		1		1		1		1		1	2	1	1	1	1	1
T 23		1		1		1		1		1		1	2	1	1	1	1	1
T 24		1		1		1		1		1		1	2	1	1	1	1	1

The versions T9 – T24 incl. are not available until further notice is given.

EXAMPLE: CQM 5112 Spec. 25x6 T21 → COMBINATIONS OF TONE EQUIPMENT
WATT ← ┘ └ → NUMBER OF CHANNELS

CHOICE OF NAMEPLATE KIT AND PUSH BUTTON

M40 5.096-4