MOBILE RADIOTELEPHONE

STORNOPHONE 5000

TYPE CQM5112

TYPE CQM5113

TYPE CQM5114

146 - 174 MHz

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TYPE CQM5112
TYPE CQM5113
TYPE CQM5114
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Contents

Service Coordination
01 - 81
4th Edition

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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), $\frac{1}{2}$e.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.

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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)

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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)

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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.

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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

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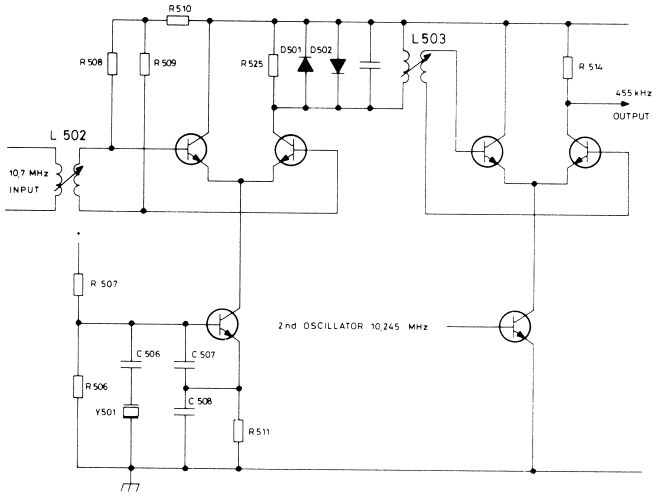
mixer and part of the transmitter PA inter-connections are design in micro-stripline techniques on the mainboard.

1st IF

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



455kHz IF/Demodulator

The selectivity of the 455kHz IF amplifier is formed by a ceramic filter fed from a 455kHz amplifier/impedance transforming stage. The final 455kHz amplification and limiting is performed by an integrated circuit , U502, which also contains the 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.

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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.

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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.

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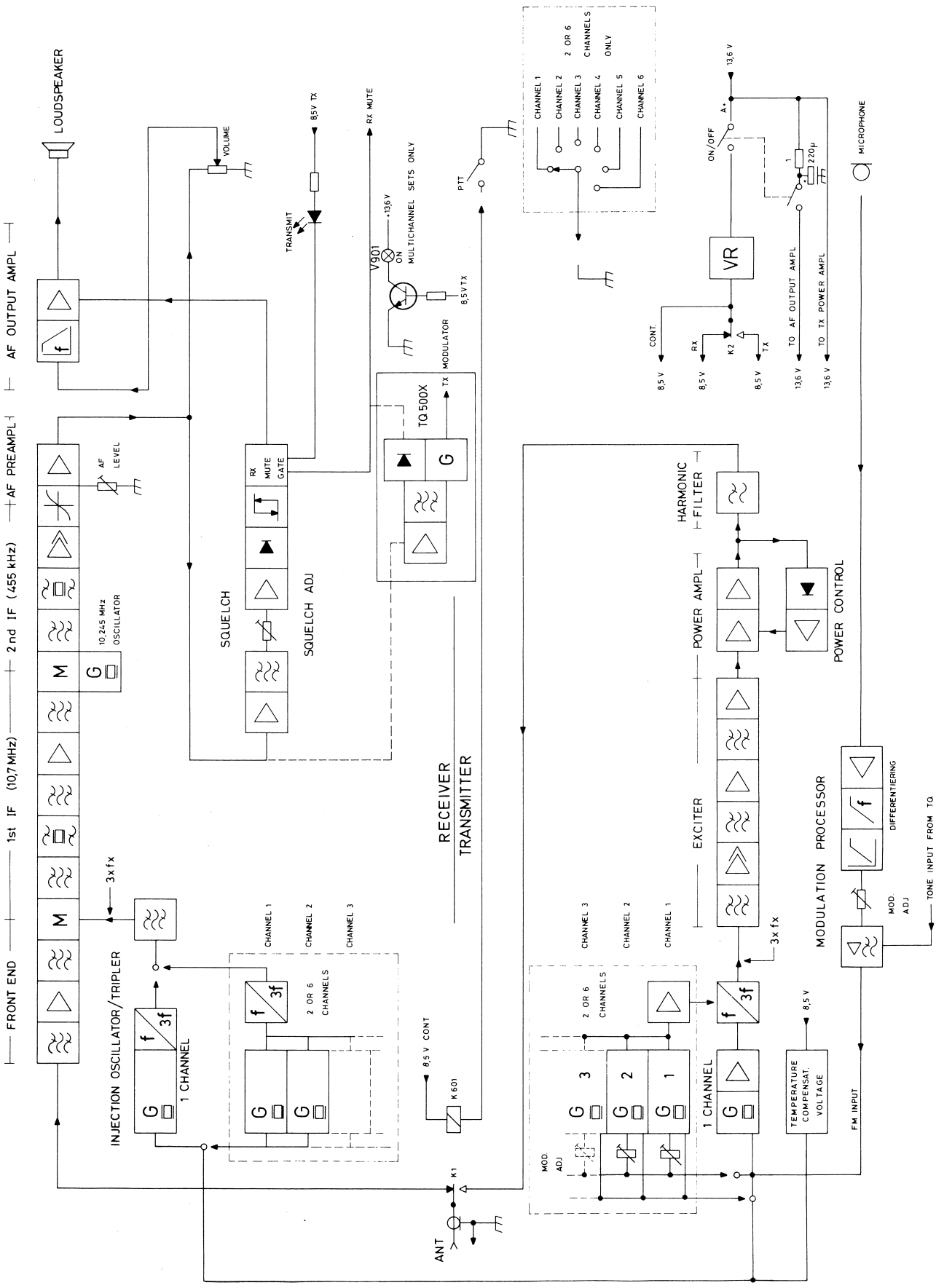

FUNCTIONAL BLOCK DIAGRAM
CQM 5110

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MICROTELEPHONE

MT5001

Microphone MT5001 is designed for mobile use in association with series 5000 radiotelephones. The unit consists of a handset and a retainer interconnected by a coil cord. When placed in the retainer the handset activates a microswitch which is used to switch off the internal loudspeaker when the microtelephone is lifted. Built into the handset are two amplifiers, AA706 and AA707, which are used to drive the telephone and amplify the microphone signals, respectively.

The microtelephone MT5001 is equipped with a Mic. connector.

STRAPPING IN CQM5000

The cable connections to the MICROPHONE connector are as follows:

Terminal no.	Colour
1	RD/Red
2	BL/Blue
3	BN/Brown
4	WH/White
5	GN/Green
6	VT/Violet
7	BK/Black
8	(N.C.)/No connection

When connecting the MT5001 to CQM5000, it is necessary to cut 3 straps and mount 3 others on the XS board in CQM5000.
Cut the following straps:

H11 - H25
H12 - H24
H13 - H23

Connect the new straps as follows:

H11 to Terminal 1 on J910 (A^+-RX)
H12 to Terminal 3 on J910 (SPKR-H_1)
H13-H18 to Terminal 10 on J910 (INT SPKR-H_1)
(see diagram D402.880)

CIRCUIT DESCRIPTION

Amplifier AA706

The amplifier consists of two stages of which the first is an amplifier and the last an emitterfollower. To ensure sufficient suppression of ripple voltage the base voltage divider of Q1 is utilizing the low dynamic resistance of a dual diode. The AF gain is for the greater part determined by the ratio of R3 to R4, and the telephone is driven via C3 in order to counteract the DC polarity. Capacitor C2 between the base and collector of Q2 between the base and collector Q2 stabilises the amplifier.

Amplifier AA707

The amplifier consists of two stages in which the AC and DC feedback is determined by the components that form the base network by Q1. The AF gain is for the greater part determined by the ratio of R4 to the series connection of R3, R2, and the microphone impedance. The normal AF gain is 30 dB but can be raised to 42 dB by shorting R3. Capacitors C2 and C3 are bypassing RF, if any present.

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TECHNICAL SPECIFICATIONS

GENERAL

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

Dimensions
215 x 80 x 65 mm

Weight
650 g

AA706

Supply Voltage
13.6 V

Current Consumption
16 mA (19 mA)

Input Impedance
9.5 Kohm

Input Level
90 mV

Output Level
450 mV

Load Impedance
300 ohm

Distortion, Vout= 1 V
10%

AA707

Supply Voltage
9 V

Current Consumption
Gain 42 dB: 7.3 mA (11 mA)
Gain 30 dB: 8.3 mA (12 mA)

Gain
30 dB (28 dB)
R3 shorted: 42 dB (40 dB)

Load Impedance
560 ohm

Output Impedance
15-50 ohm

Output Level
110 mV

Distortion, Vout= 1 V
10%

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PS5001
POWER SUPPLY UNIT

General

The PS5001 is a mains operated power supply for the Stornophone 5000 radiotelephone when used as base station. The unit consists of a mains transformer, a rectifier, a smothing filter, a switching regulator, and an output filter. The unit will supply 13.6 Volt stabilized DC when connected to a 220V/240V AC outlet.
A LED (light emitting diode) on the front panel is lit when the unit is on.

Circuit Description

Power Transformer

The power transformer is wound on a toroide core and has two windings, a 220/240Volt primary and a 24 Volt secondary. A 4 Amp slow blow fuse in series with the secondary winding protects those parts of the circuitry which are not protected by the electronic current limiter in the switching regulator.

Switching Regulator

The switching circuit is built as a normal switching mode regulator with constant switching frequency, approximately 32KHz, and variable duty cycle. The actual switching function is performed by the transistor configuration Q2, Q3, Q4 and the fly-back diode D4, which clamps the input of L-C filter L2-C8 to ground potential in that portion of the cycle where the switching transistors are off and D4 is forced to conduct by the energy from the collapsing field of L2.

The output voltage across C8 is sensed by IC1a and compared to the reference voltage across D2-D3. The resulting signal is amplified by IC1b which is driving Q2 and in turn Q3 and Q4.

Output current limiting is achieved by monitoring the voltage drop across R17 and feed this voltage to IC1d. The IC1d output is 'OR-ed' with the voltage control signal at the IC1a output and therefore overrides the control voltage when the output current goes excessively high.

The two filters, C2-L1-C3, and C8-L3-C9, are ripple-transient filters on the input and output and their function is to ensure that the inherent switching noise does not exceed acceptable limits on the input and output terminals, and the cables as well.

Technical Specifications

Mains Voltage
220/240V AC + 10/-15%; 50-60Hz

Power Consumption
Approx. 6mA; 0 Amp load
Approx. 450mA; 6 Amp load

Output Voltage
13,6V DC $\pm$ 1,0V

Output Current
Maximum 6 Ampere (short circuit protected)

Output Voltage Ripple
Less than 100mV pp (peak to peak)

Switching Frequency
approx. 32KHz

Temperature Range
$-10^{o}C$ to $+50^{o}C$

Duty Cycle
as specified for CQM5000

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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

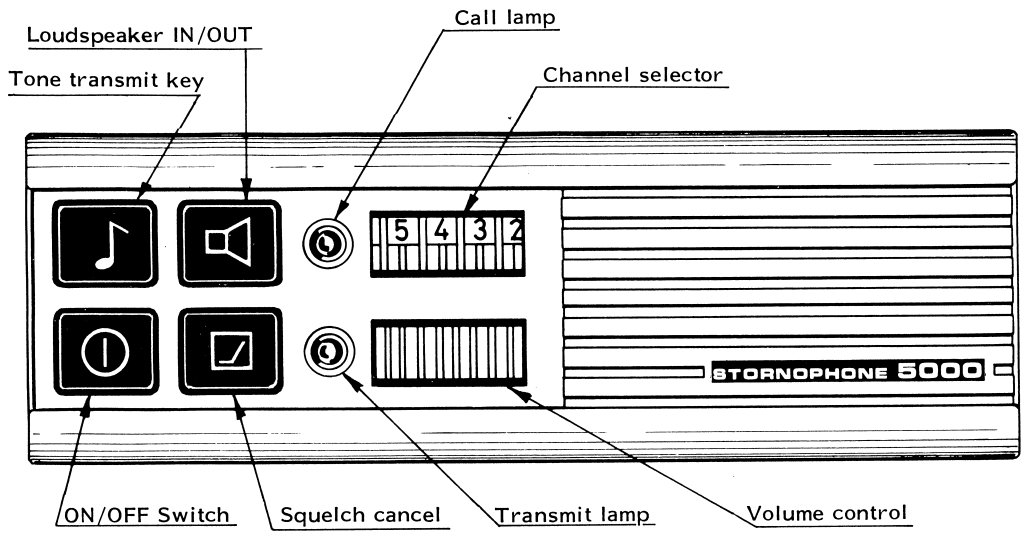
The radio is turned on by depressing the ON/OFF switch.
The thumb-wheel channel selector is accessible on the multichannel version and has the channel numbers on the rim. A lamp built into the channel selector illuminates the channel number from the inside. Single channel units have no 'power on' indicator.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

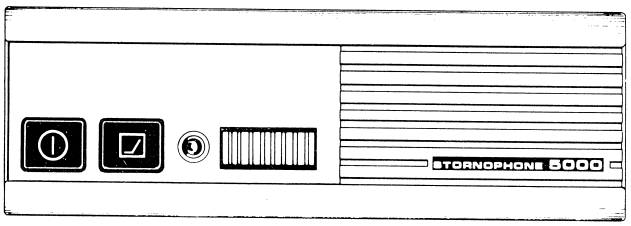
RECEIVE WITHOUT TONE EQUIPMENT

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.

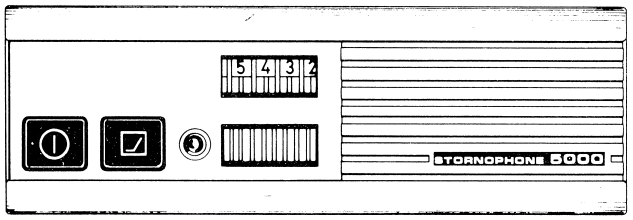
RECEIVE WITH TONE EQUIPMENT

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.

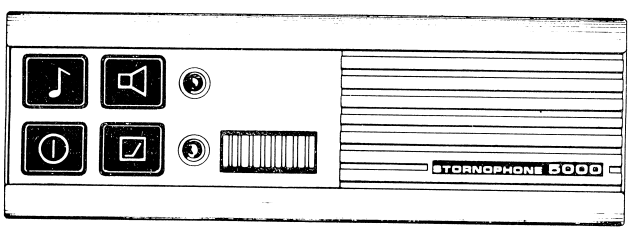
TRANSMIT WITHOUT TONE EQUIPMENT

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

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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

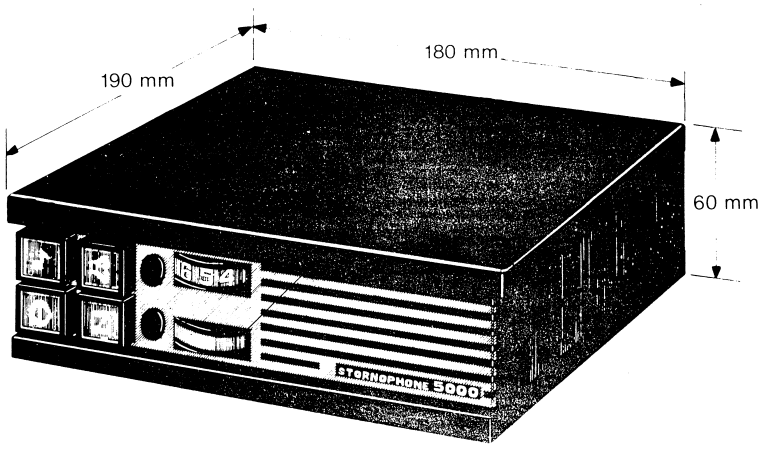
Each shipment should be checked against the packing list or invoice when arriving, and Storno must be notified immediately of any damage or shortage.

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°C to +60°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.

or

MN704a Cradle for direct attachment to the vehicle.

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

MC704 Microphone for fixed mounting. A bracket with rubber shock mounts are included.

MC5001 Fist microphone with PTT button and hook.

HS5001 Retainer for MC5001

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.

SU701 Keying switch, long lever

SU702 Keying switch, short lever

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.).

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:

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
MC703a	Desk microphone with PTT button
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-

tors (5 Kohm) are recommended as these resistors suppress the noise better than the carbon types (10-15 Kohm).
Suppressor resistors in the spark plug leads must be placed as close as possible to the spark plugs and the spark gap should be increased. Consult the car instruction manual for the exact width.

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 builtin 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 0,1 uF 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 identified 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.

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.

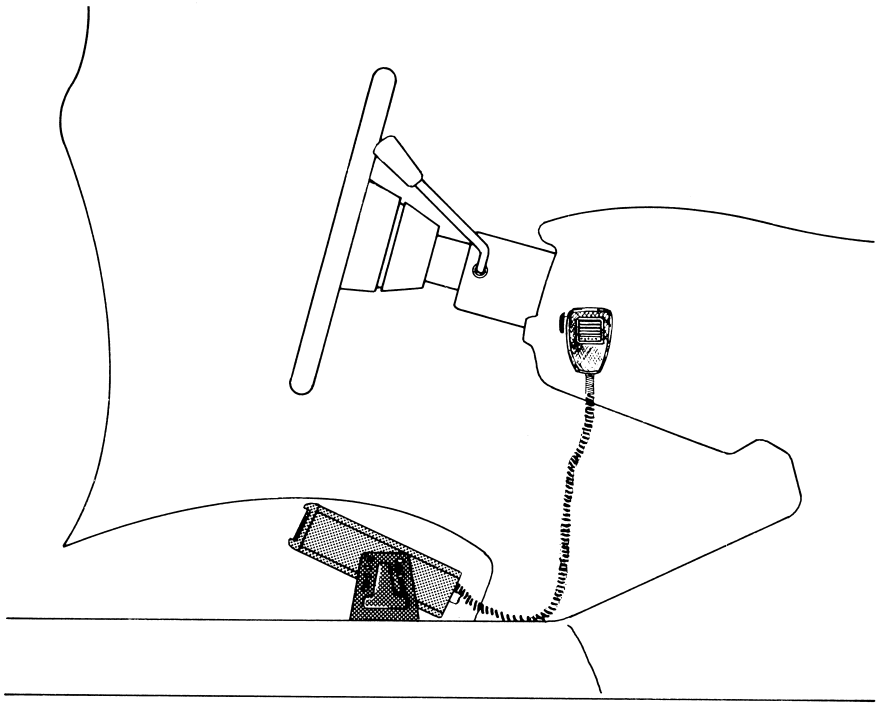


Fig. 1

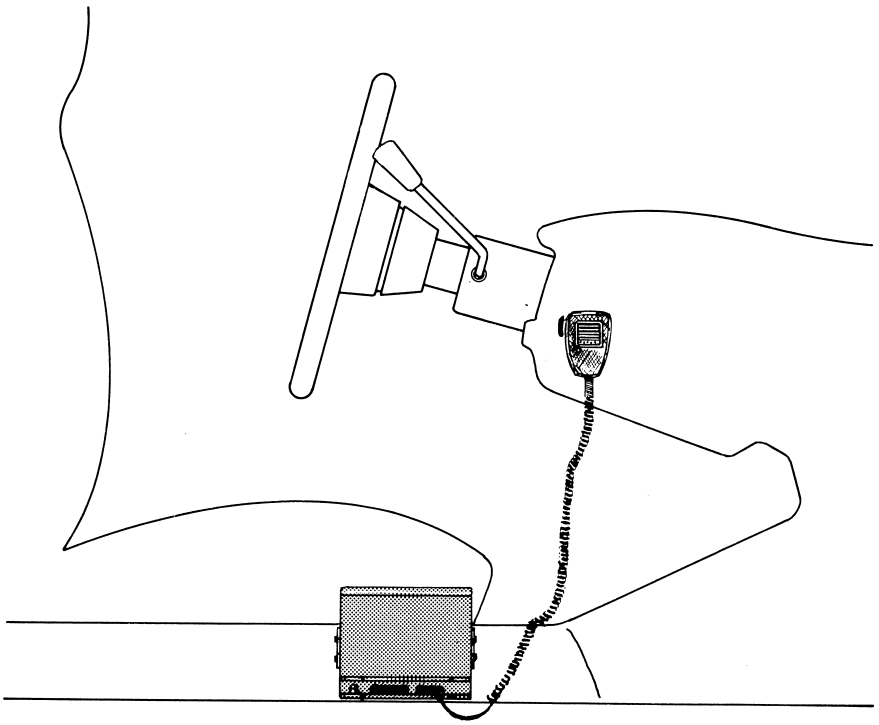


Fig. 2

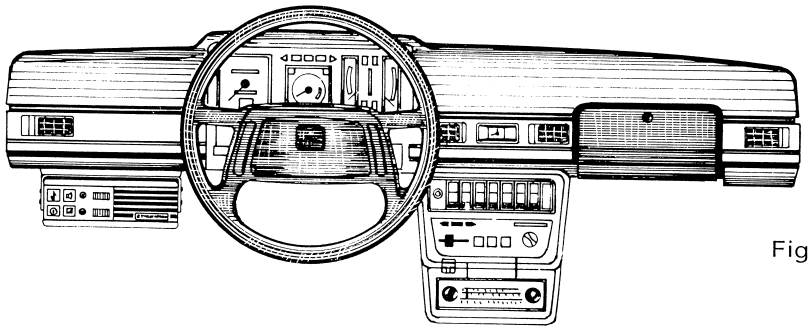


Fig. 3

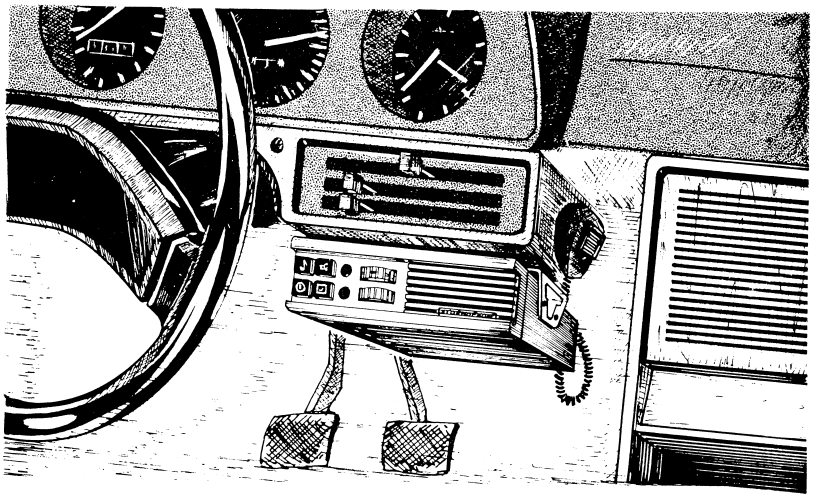


Fig. 4

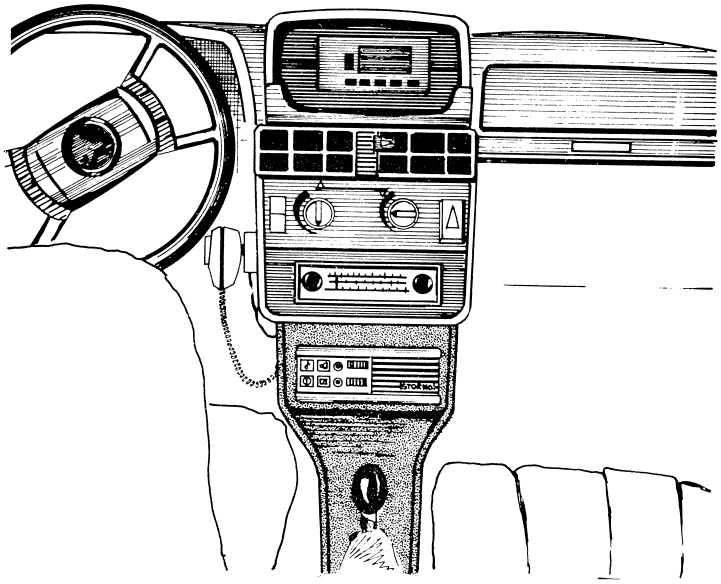


Fig. 5

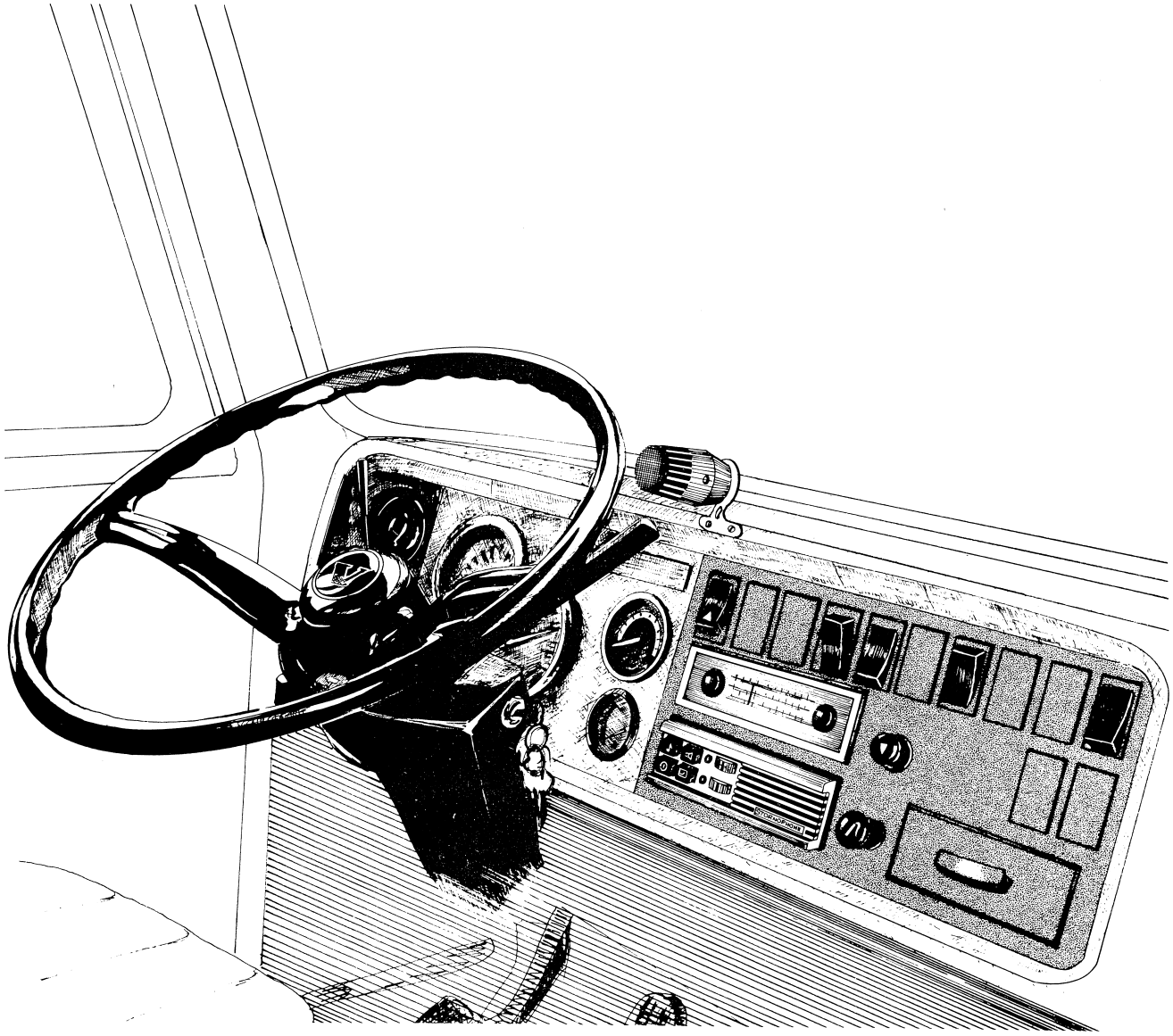


Fig. 6

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 λ/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. 2 dB 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 λ/2 DIPOLE (0 dB)

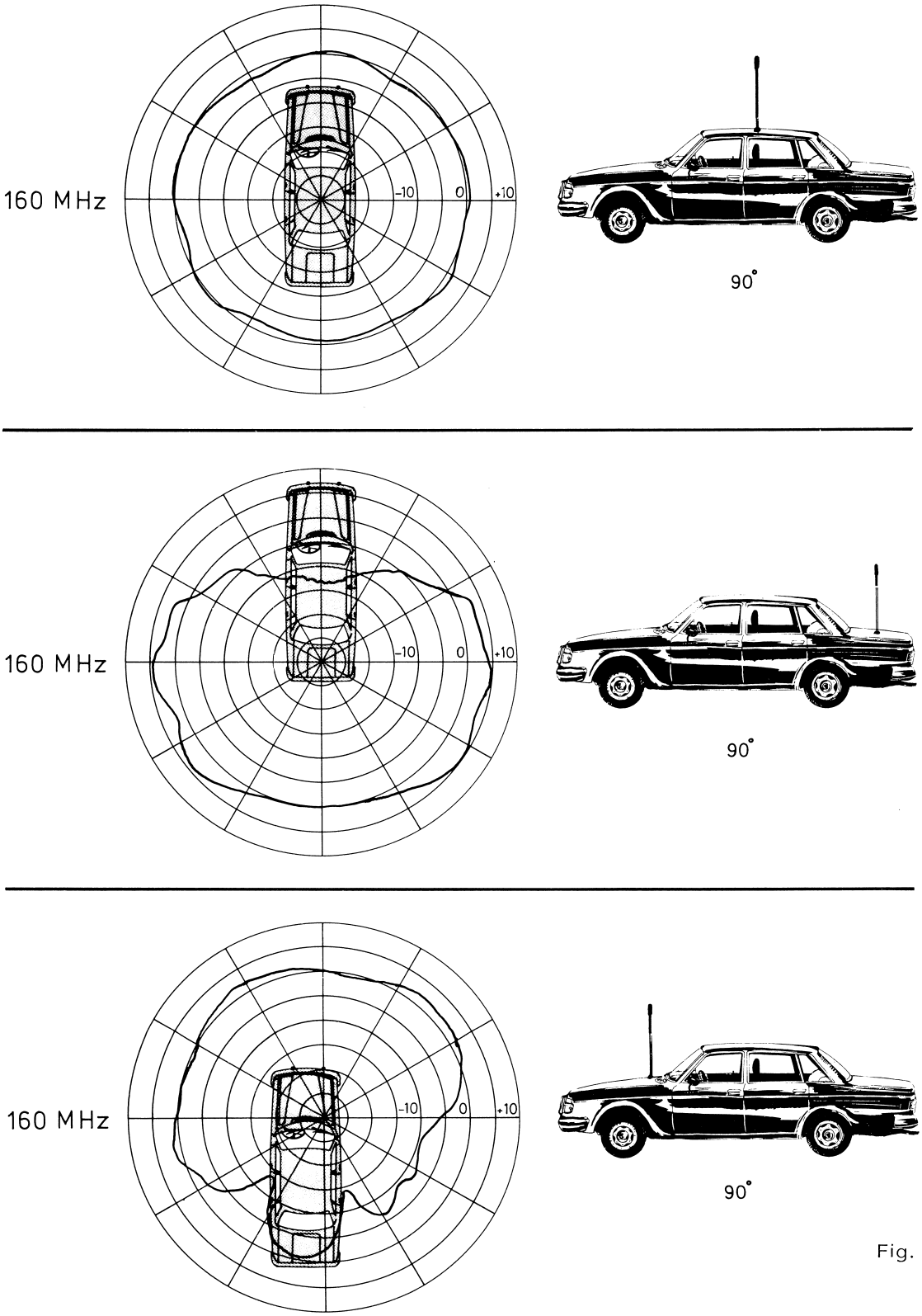
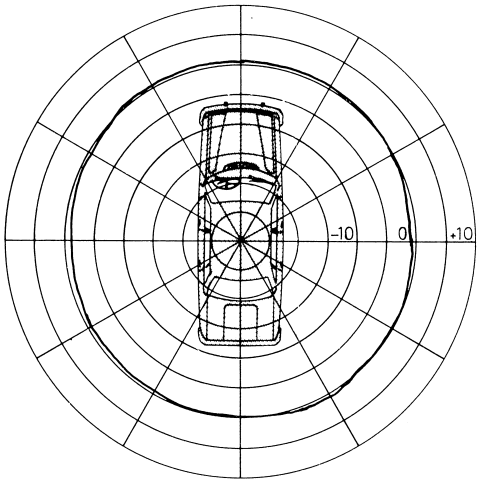
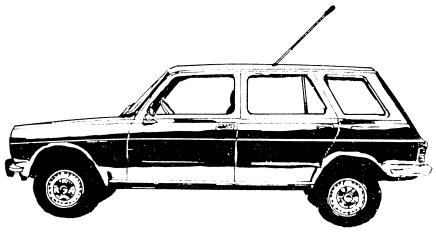


Fig. 7

ATTENUATION RELATED TO λ/2 DIPOLE (0 dB)

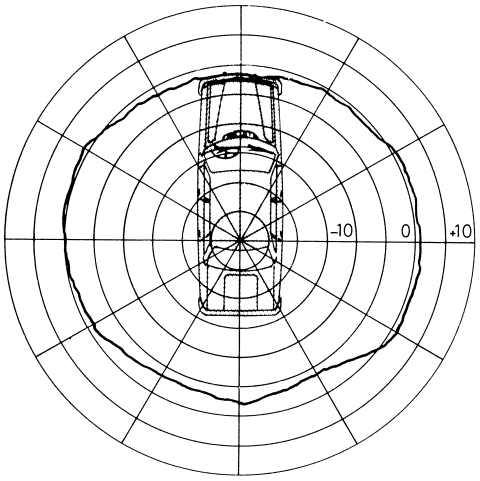
160 MHz

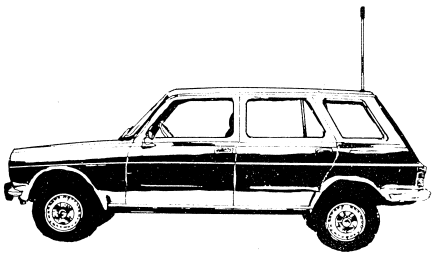




45°

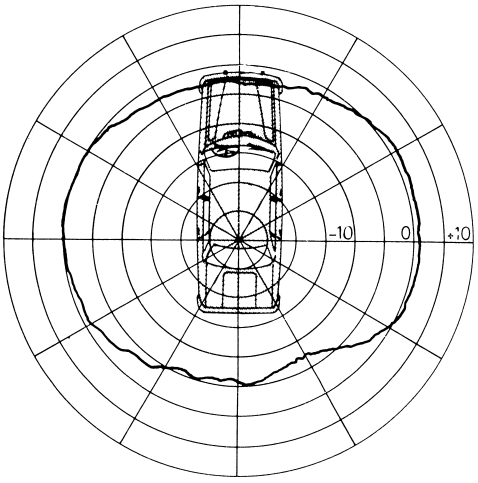
160 MHz

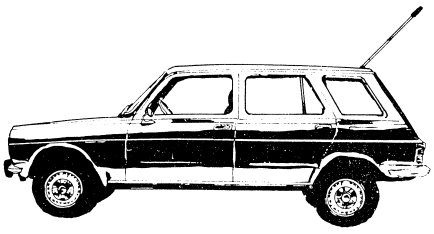




90°

160 MHz



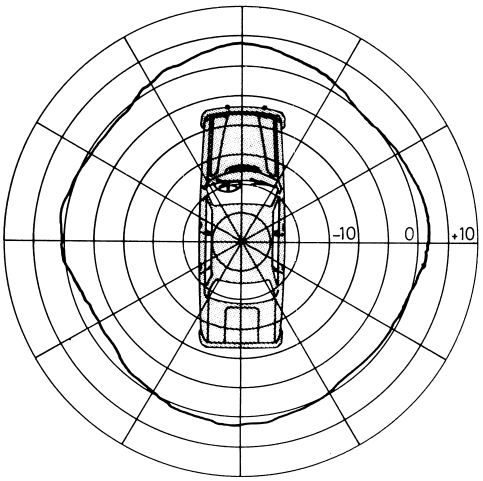


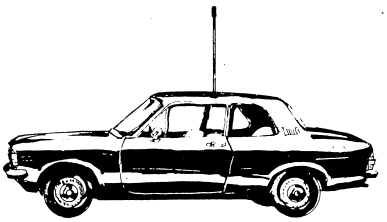
45°

Fig. 8

ATTENUATION RELATED TO λ/2 DIPOLE (0 dB)

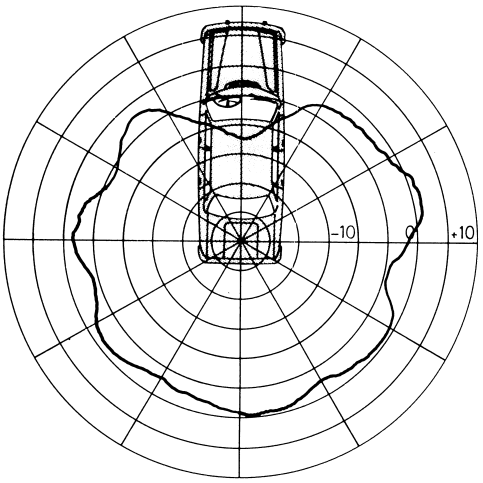
160 MHz

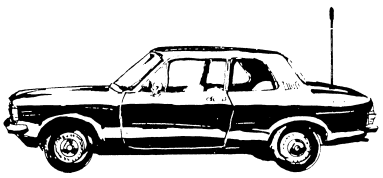




90°

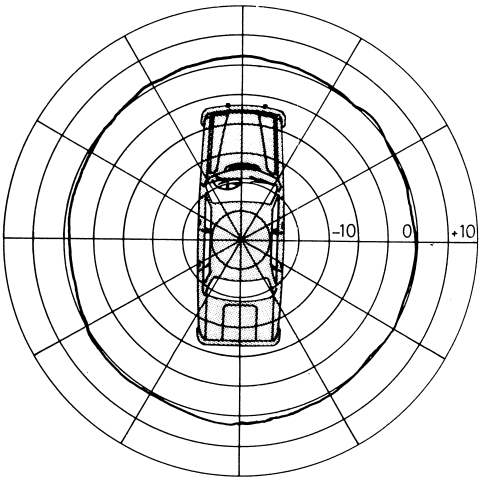
160 MHz





90°

160 MHz



90°

Fig. 9

Storno

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

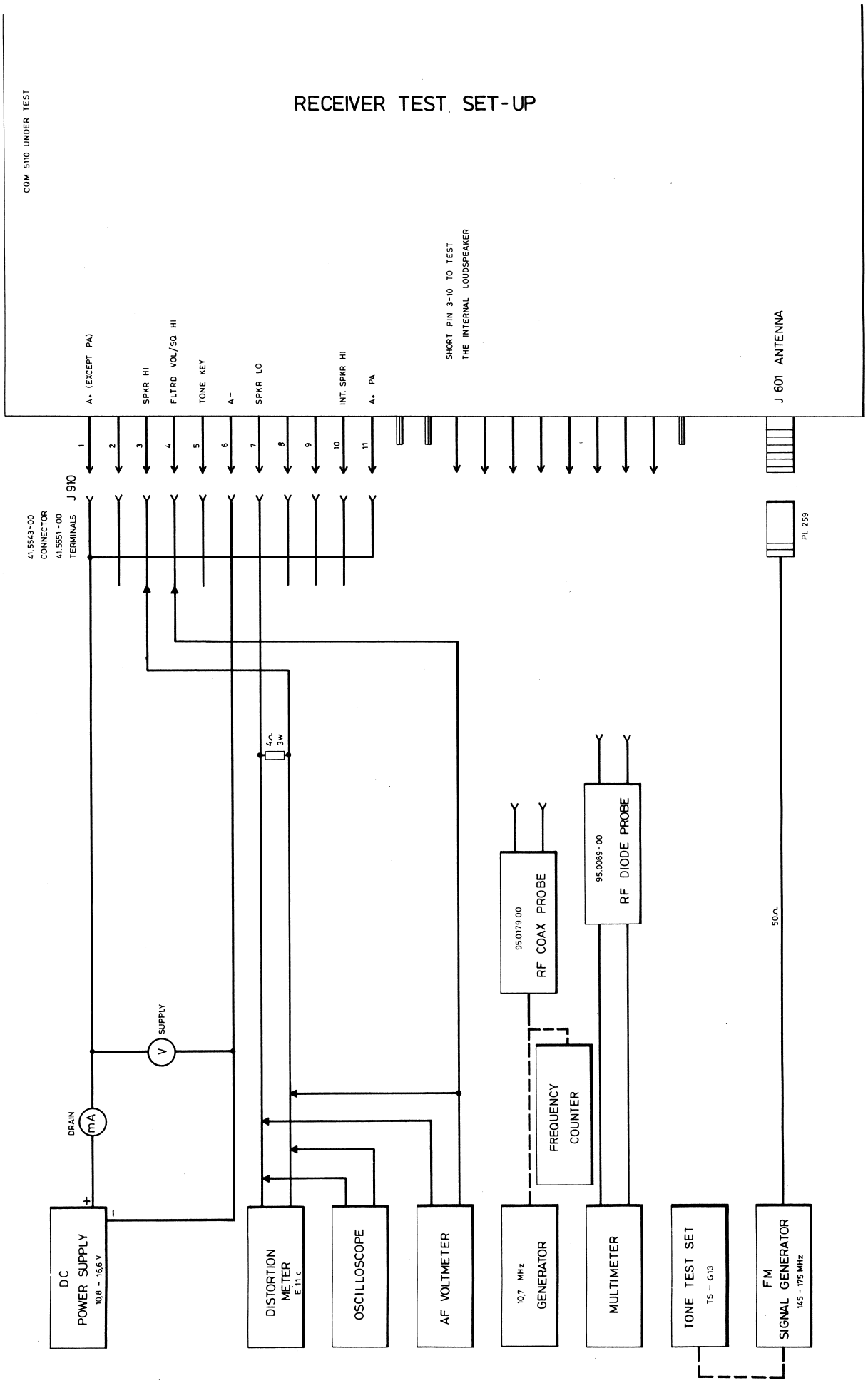
Adjust the power supply voltage to 16.6 V and read the 8.5 V regulated. Compare the change in the 8.5 volt regulated to the value obtained at 13.2 V.

Requirement: $\leq$ 50 m V

Repeat the procedure with the power supply adjusted for 10.8 V

Storno

RECEIVER TEST SET-UP



Storno

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: ≤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: ≤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.

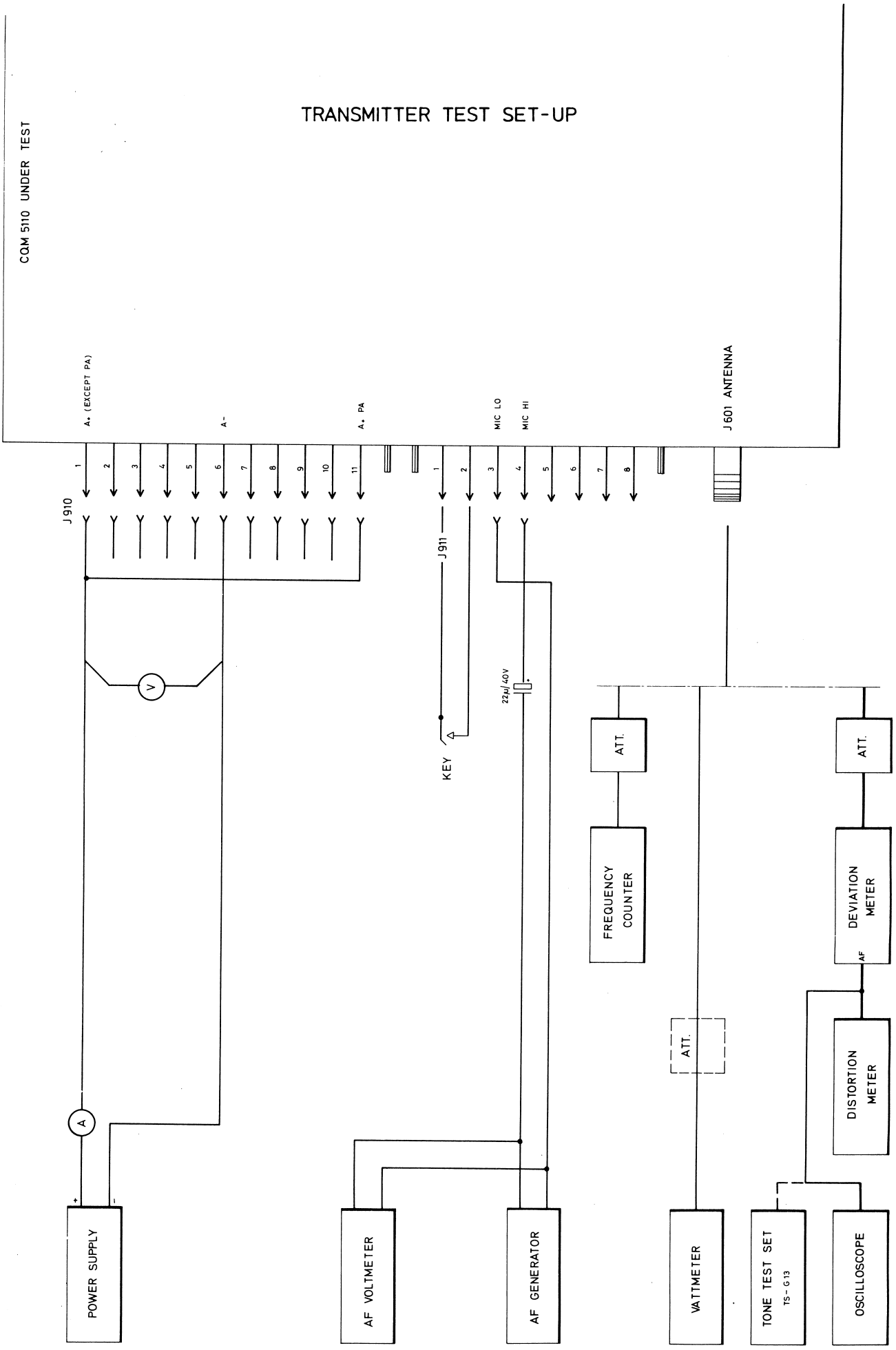
Multichannel sets

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



Storno

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)

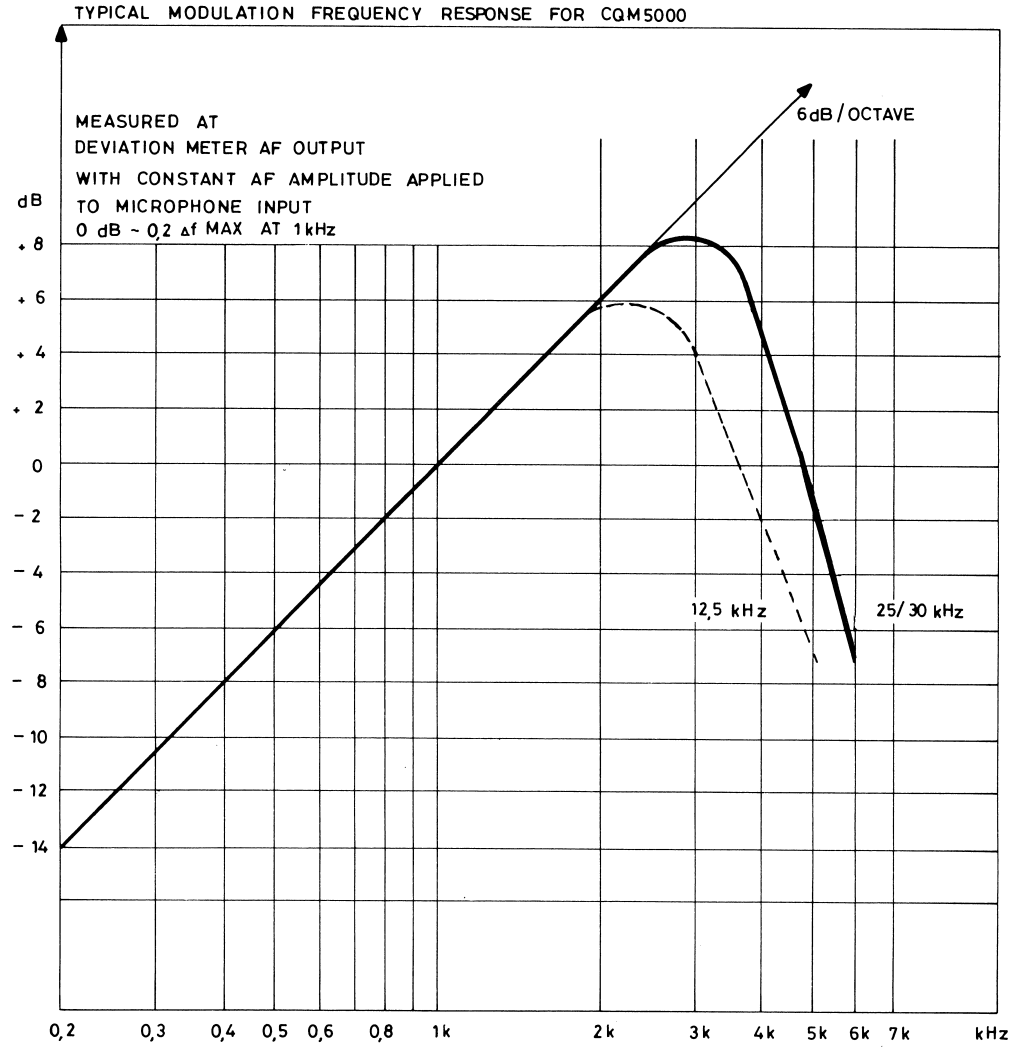
Modulation frequency response

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.

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
dB
+ 8
+ 6
+ 4
+ 2
0
- 2
- 4
- 6
- 8
- 10
- 12
- 14
12,5 kHz
25/ 30 kHz
0,2
0,3
0,4
0,5
0,6
0,8
1k
2k
3k
4k
5k
6k
7k
kHz

Storno

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

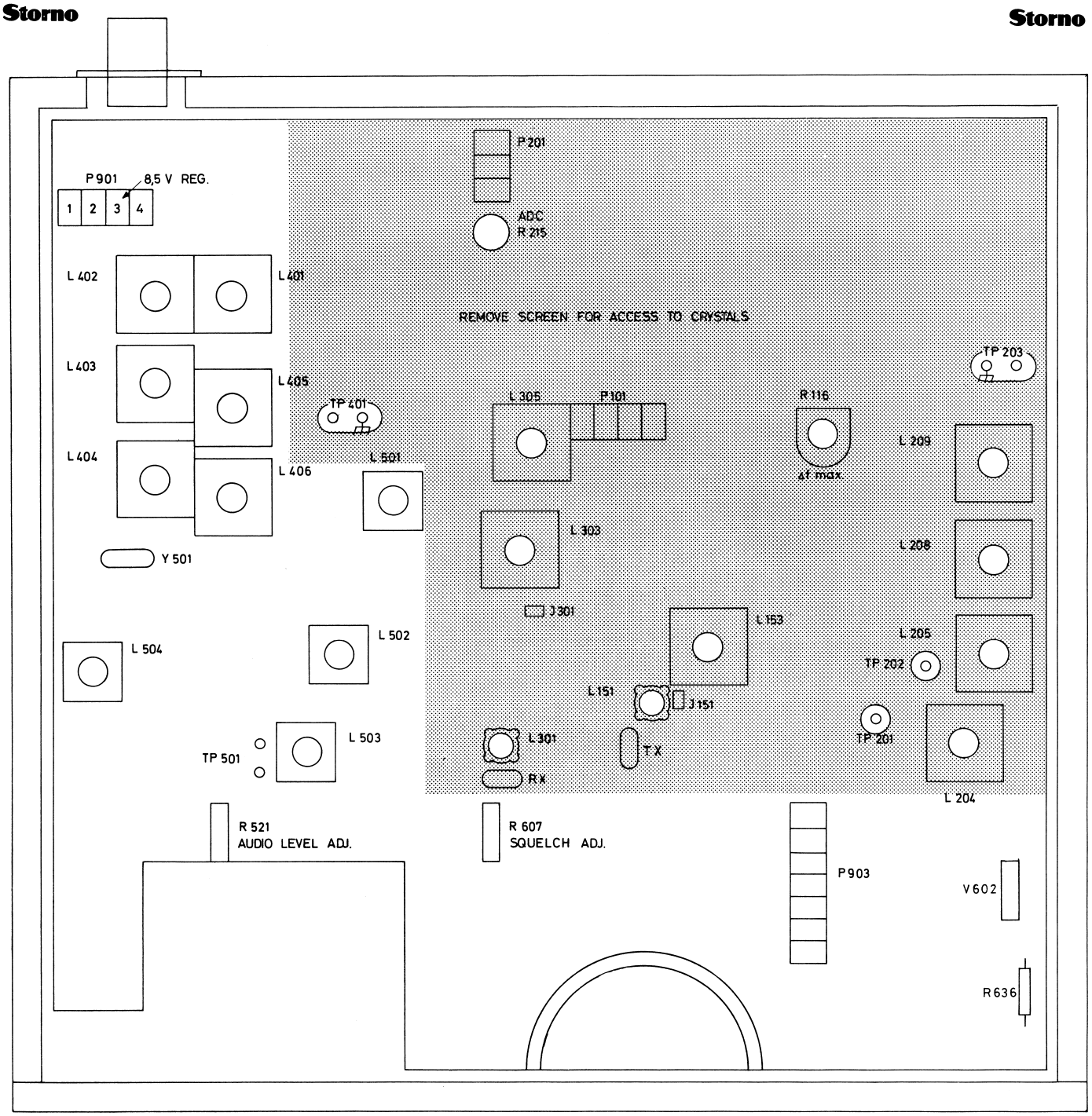
Apply Standard test condition to the receiver; refer to receiver test setup.

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.

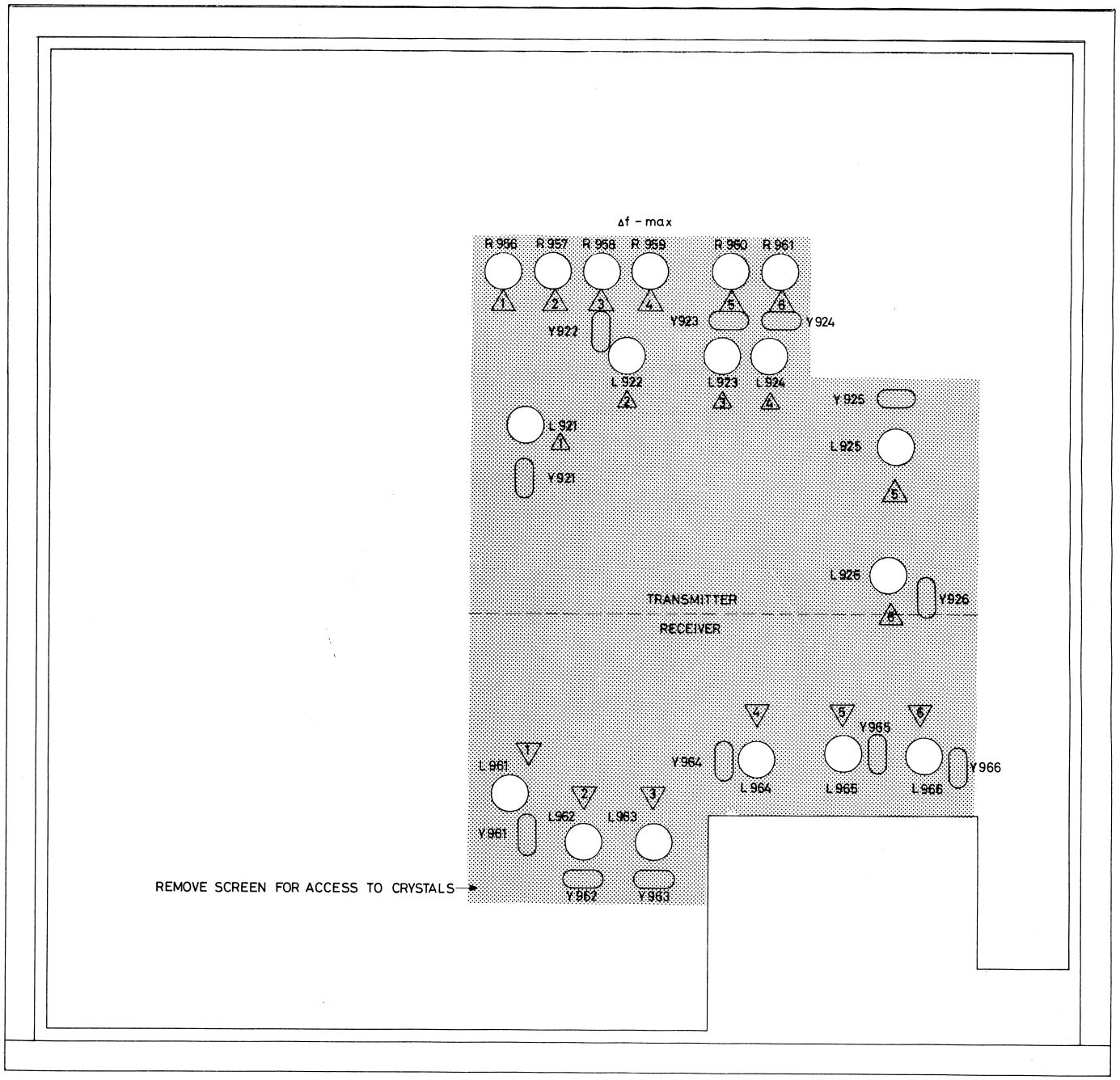
Storno



ADJUSTABLE COMPONENTS AND TEST POINTS ON RF 5110

D402.623

Storno



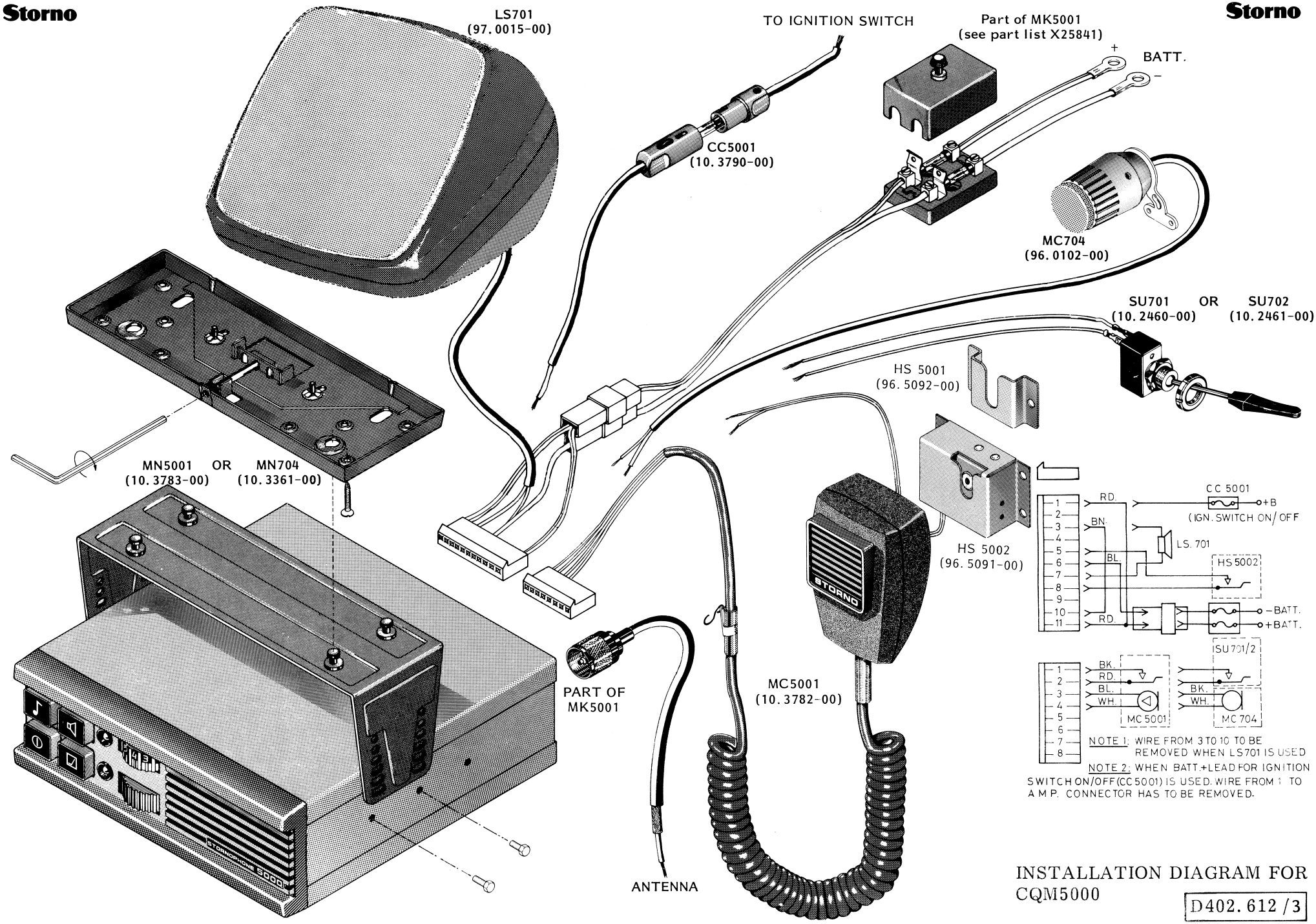
▽ = RECEIVER CHANNEL

△ = TRANSMITTER CHANNEL

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

D402.624/2

Storno **Storno**

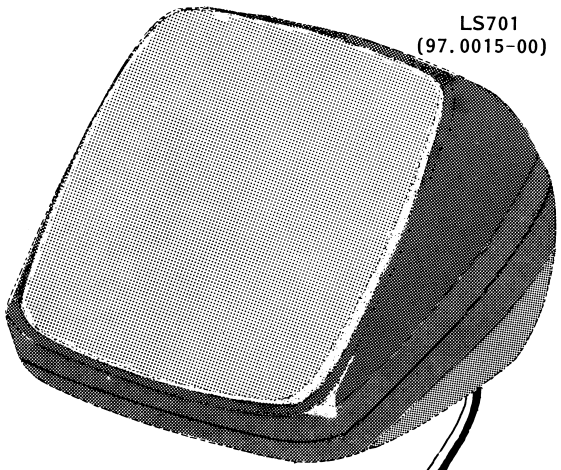


INSTALLATION DIAGRAM FOR
CQM5000

D402.612/3

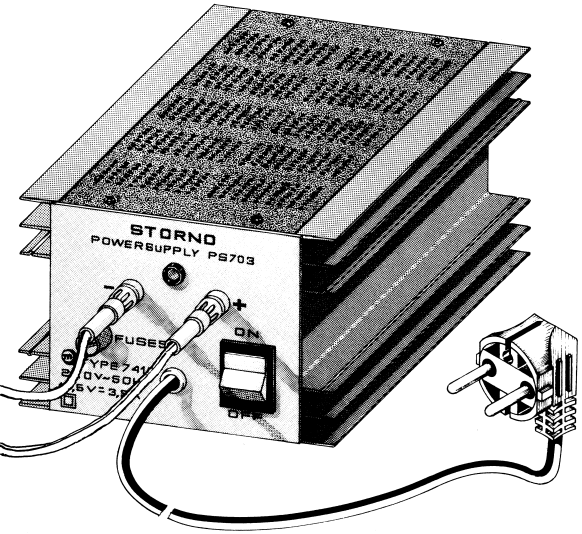
Storno

Storno

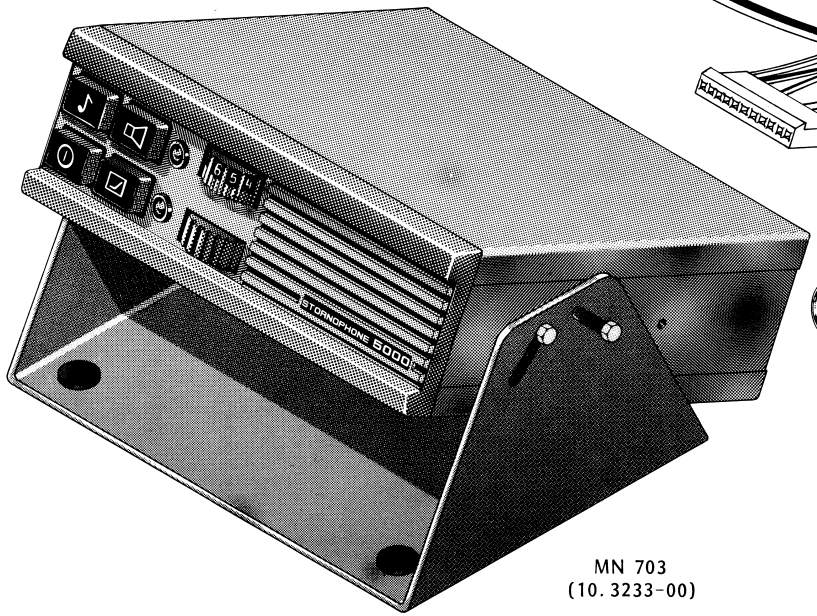


LS701
(97.0015-00)

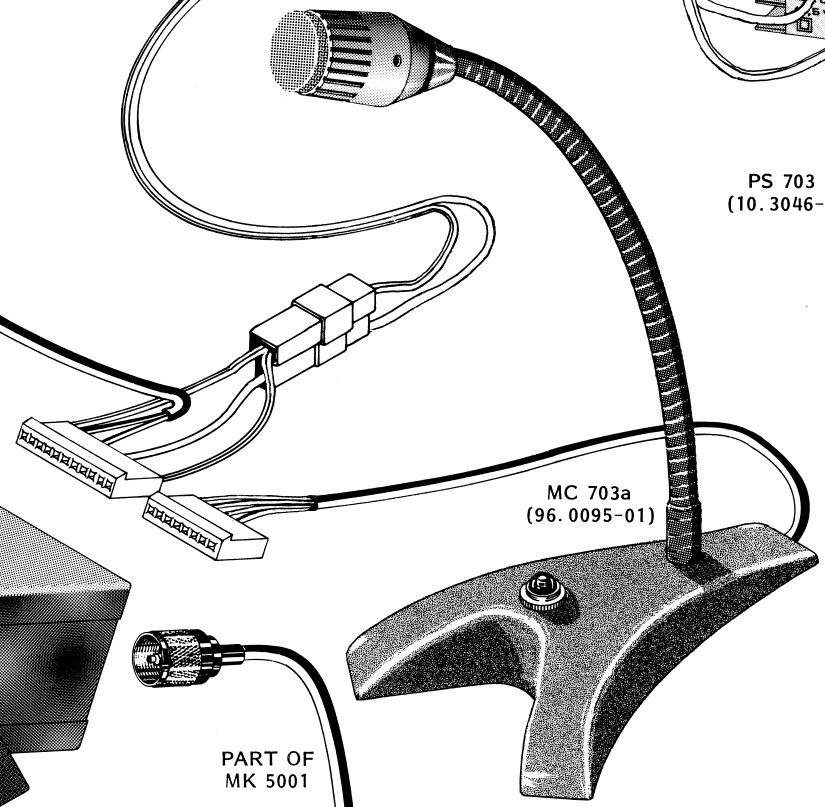
Part of MK5001
(see part list X25841)



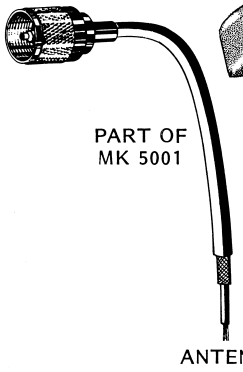
PS 703 OR Ps 5001
(10.3046-00) (10.3786-00)



MN 703
(10.3233-00)

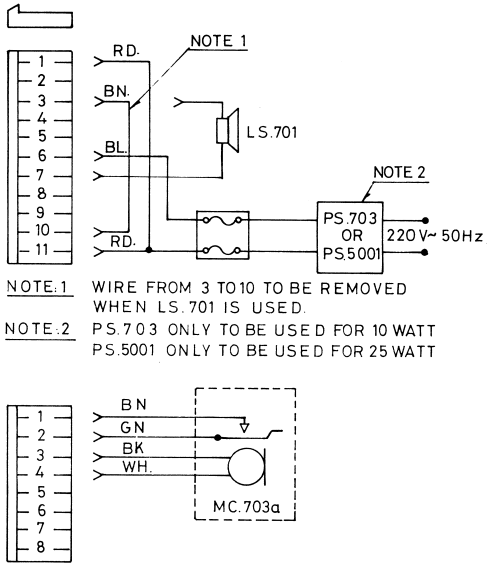


MC 703a
(96.0095-01)



PART OF
MK 5001

ANTENNA



NOTE:1 WIRE FROM 3 TO 10 TO BE REMOVED WHEN LS.701 IS USED.

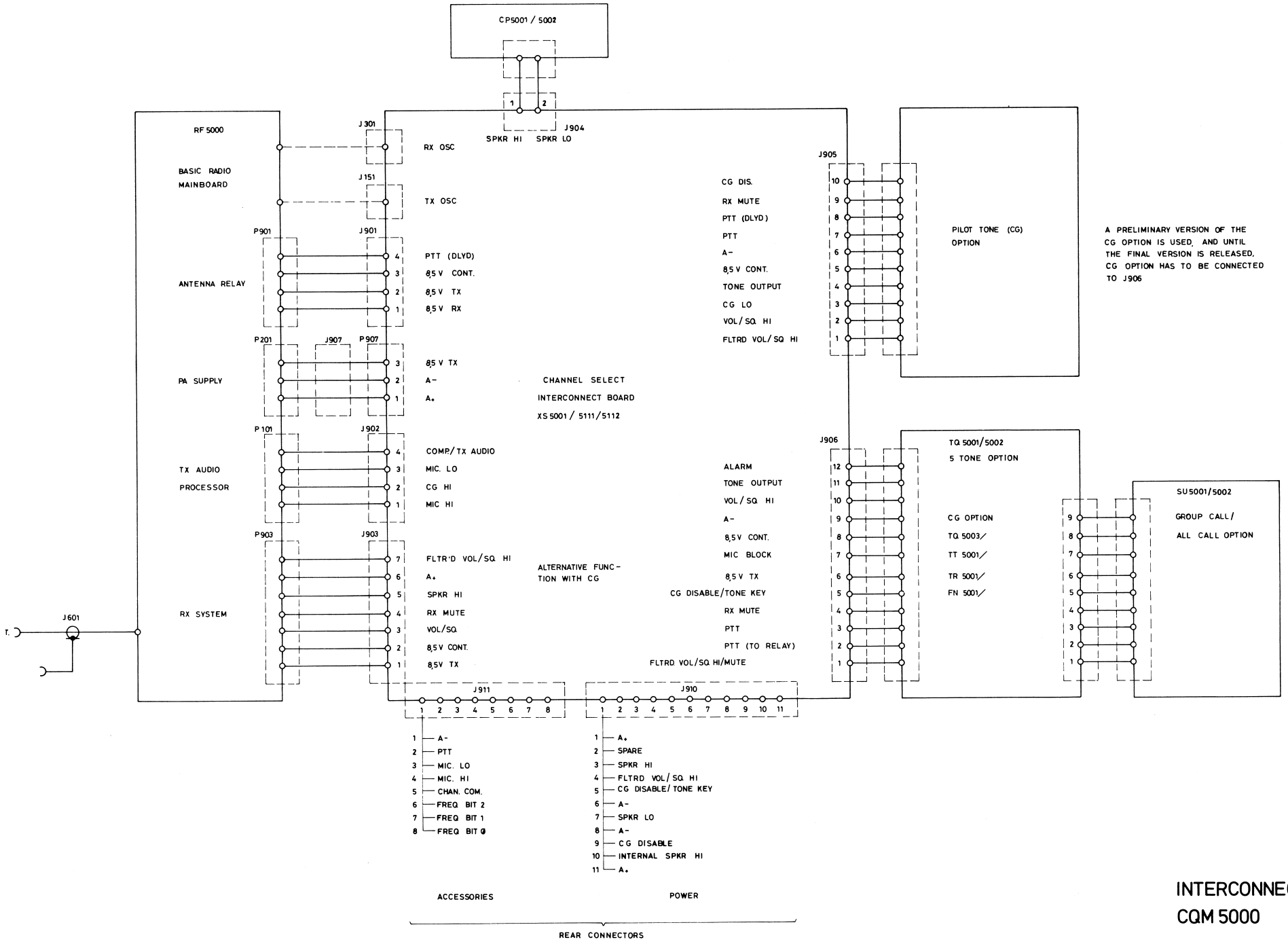
NOTE:2 PS.703 ONLY TO BE USED FOR 10 WATT
PS.5001 ONLY TO BE USED FOR 25 WATT

FIXED INSTALLATION DIAGRAM FOR CQM 5000

D402.644/2

Storno

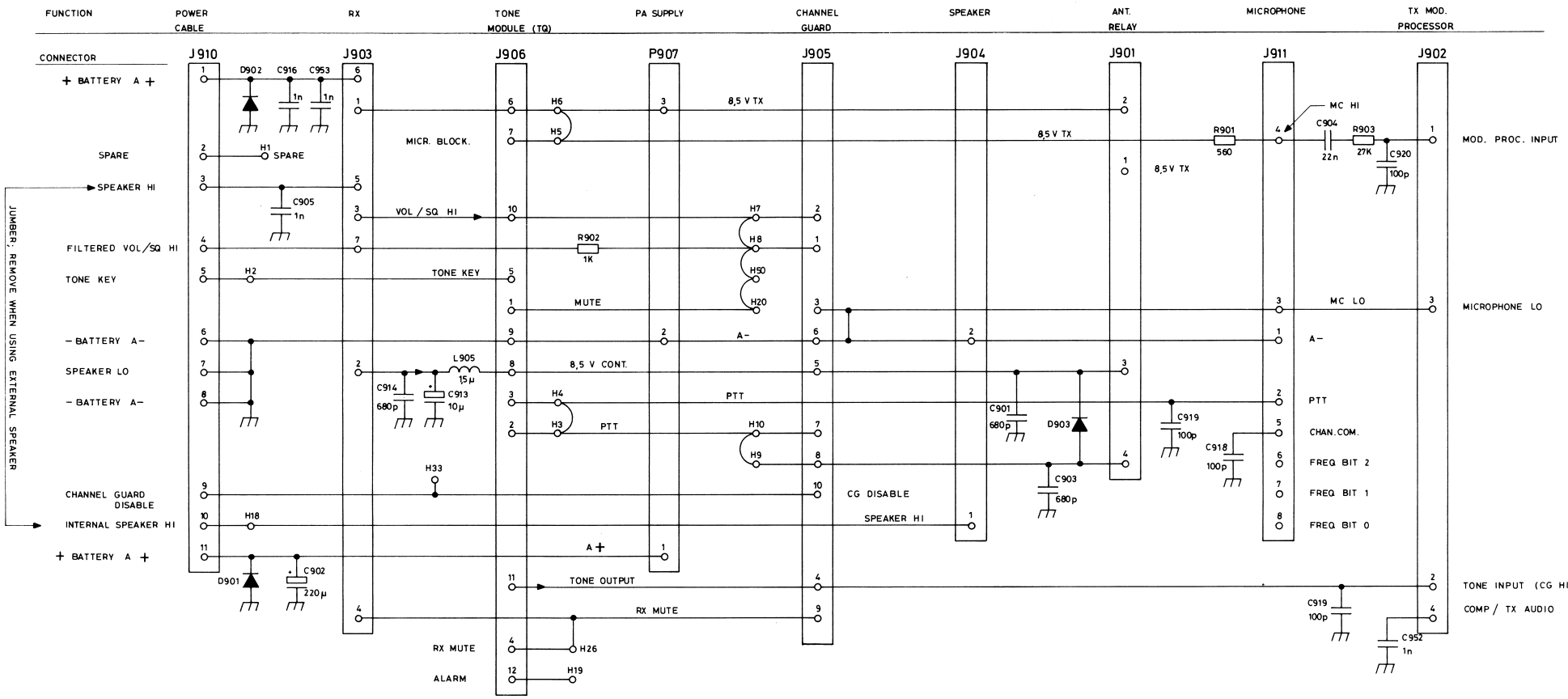
Storno

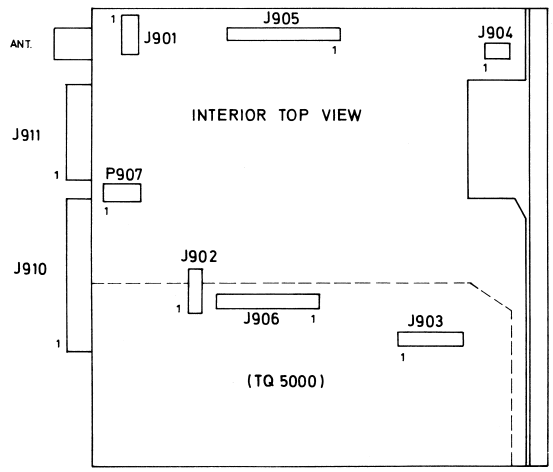


INTERCONNECT DIAGRAM

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

MIXER

RF AMPLIFIER

10,7 MHz AMPL.

AUDIO LEVEL ADJ

AF AMPLIFIER

SQUELCH

FROM TRANSMITTER OUTPUT

OSCILLATOR

TRIPLER

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 : 1,8K

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

MODULATION PROCESSOR

OSCILLATOR

BUFFER

TRIPLER

EXCITER

POWER CONTROL

POWER AMPLIFIER

HARMONIC FILTER

TO ANTENNA RELAY

RF UNIT RF5110

D402.613/4

Storno

RF UNIT RF5110

D402.640

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
SWE	C108	76.5135	10nF 10% Polyester FL	50V
RF5114	C108	76.5135	10 nF 10% Polyester FL	50V
+	C109	76.5156	1 nF 5% Polyester FL	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
+	C113	74.5374	18 pF 5% Ceram DI	50 V
+	C114	74.5395	470 pF 20% Ceram DI	50V
	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	74.5370	8.2 pF 0.25 pF Ceram DI	50 V
	C158	74.5378	39 pF 5% Ceram DI	50 V
+	C201	74.5392	150 pF 20% 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

Storno

TYPE	Nº	CODE	DATA	
	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
	C236	73.5173	10 uF 20% Tantal	16V
	C237	75.5028	220 pF 5% Mica	250 V
10W +	C238	75.5030	68 pF 5% Mica	250V
25W	C238	75.5020	100 pF 5% Mica	250V
+	C239	75.5019	10 pF 5% Silv. Mica	250 V
	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	22 pF 5% Ceram DI	50V

RF UNIT RF5110

X402.653/2

TYPE	Nº	CODE	DATA	
	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
	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	19J706280P1	2.2 nF 10% Ceramic 2DI	125 V
+	C415	74.5389	330 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
	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	6.3 V
	C611	76.5144	0.1 uF 10% Polyest FL	63 V

TYPE	Nº	CODE	DATA	
	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
	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	99.5374	1N458A Diode, selected	
+	D102	99.5374	1N458A Diode, selected	
	D151	99.5341	Cap. Diode	
	D152	99.5237	1N4148 Diode	
	D201	99.5237	1N4148 Diode	
	D301	99.5341	Cap. Diode	
	D501	99.5237	1N4148 Diode	
	D502	99.5237	1N4148 Diode	
	D601	99.5237	1N4148 Diode	
	D602	99.5237	1N4148 Diode	
	D603	99.5237	1N4148 Diode	
	D604	99.5237	1N4148 Diode	
	D605	99.5237	1N4148 Diode	
	D606	99.5303	1.6 V LED	20 mA
+	D607	99.5237	1N4148 Diode	
	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	

RF UNIT RF5110

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TYPE		Nº	CODE	DATA	
		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	
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	
10W		L228	62.0986	146-174 MHz RF coil	
25W	+	L228	62.1030	AIR 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	62.0984-01	146-174 MHz RF coil	
10 W		L230	62.0986	146-174 MHz RF coil	
	+	L232	62.1031	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	61.5050	10.7-21.4 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	0.01 A
		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	

Storno

TYPE		Nº	CODE	DATA	
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	
		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
SWE		R109	80.5252	1.8Kohm 10% Carbon film	0.125W
RF5114		R109	80.5252	1.8 Kohm 5% Carbon film	0.125W
		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	80.5267	3 3 Kohm 1% Metal Film	0.25 W
	+	R115	80.5253	2.2 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	33 Kohm 1% Metal film	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	80.5259	6.8 Kohm 5% Carbon film	0.125 W
		R158	80.5242	270 ohm 5% Carbon film	0.125 W

RF UNIT RF5110

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TYPE	Nº	CODE	DATA	
	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
	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
+	R224	89.5089	10 ohm 5% Carbon comp.	0.5W
	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	80.5259	6.8 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

Storno

TYPE	Nº	CODE	DATA	
	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
	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

RF UNIT RF5110

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TYPE		Nº	CODE	DATA	
		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	89.5093	3 Kohm 5% Carbon film	0.125 W
		R626	80.5249	1 Kohm 5% Carbon film	0.125 W
	+	R627	80.5240	180 ohm 5% Carbon film	0.125 W
	+	R628	80.5239	150 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
		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	14.5141	4558 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

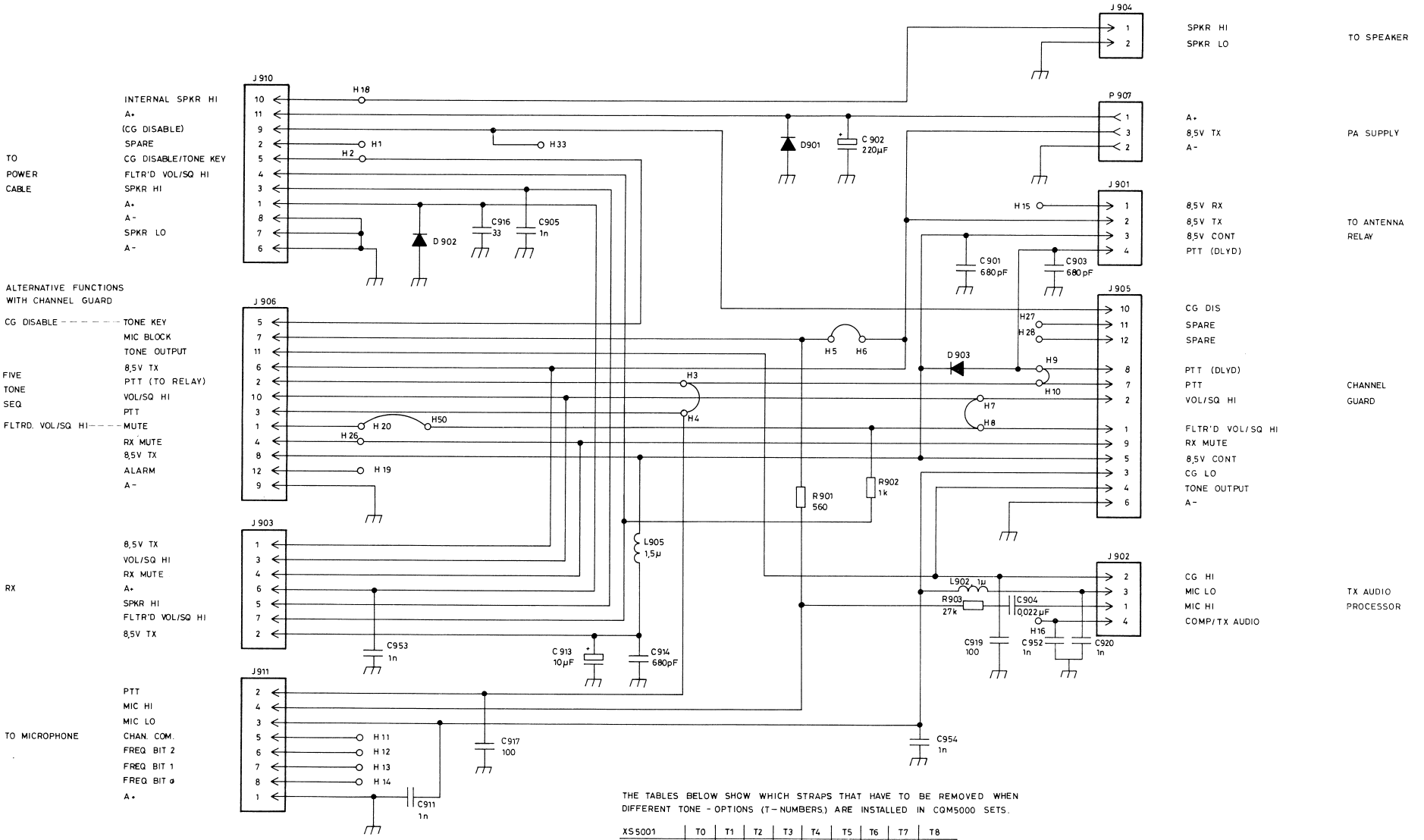
TYPE	Nº	CODE	DATA

RF UNIT RF5110

X402.653/2

Storno

Storno



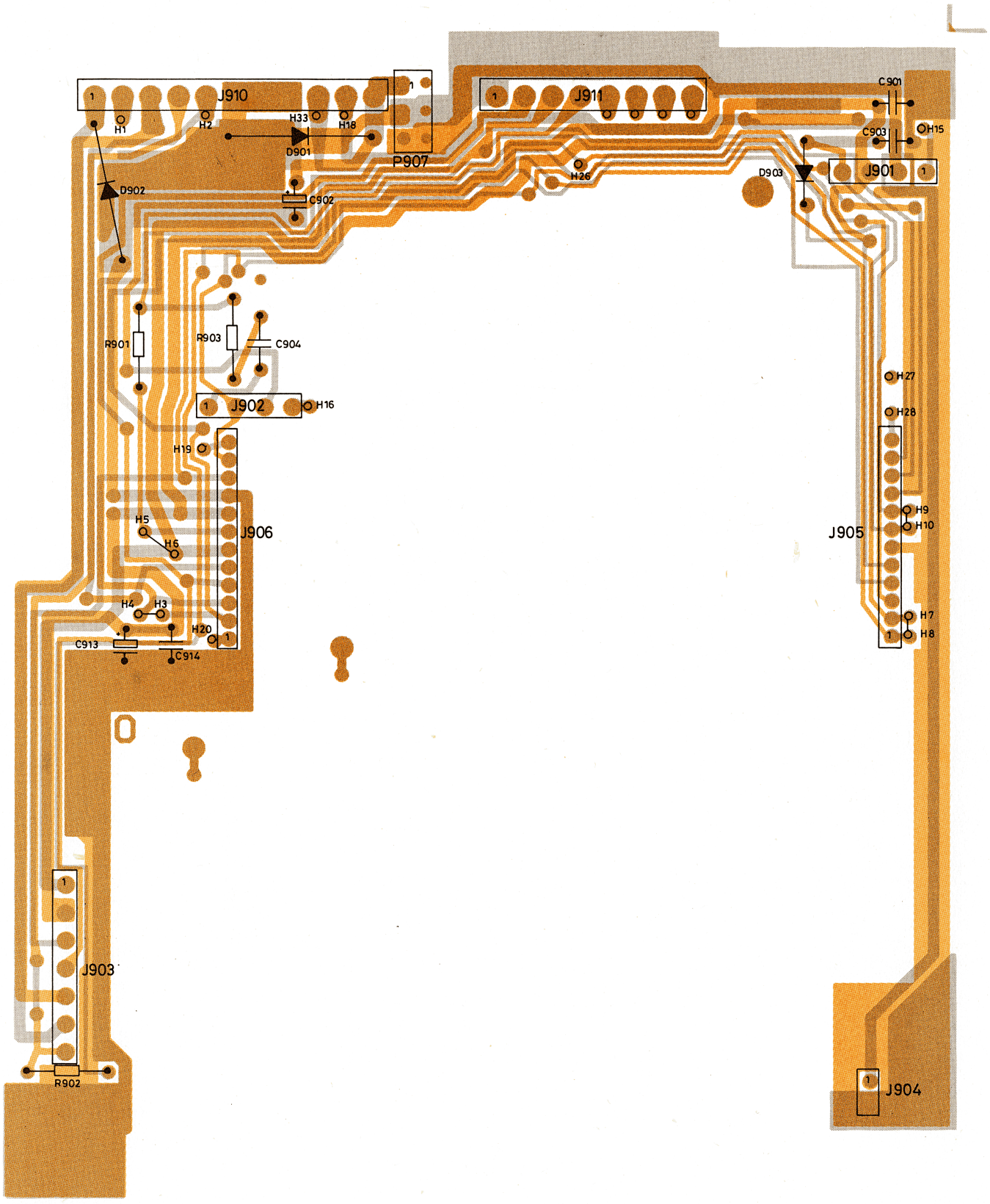
THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE - OPTIONS (T-NUMBERS.) ARE INSTALLED IN CQM5000 SETS.

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

INTERCONNECT UNIT XS 5001

D402.615/2

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	99.5220	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

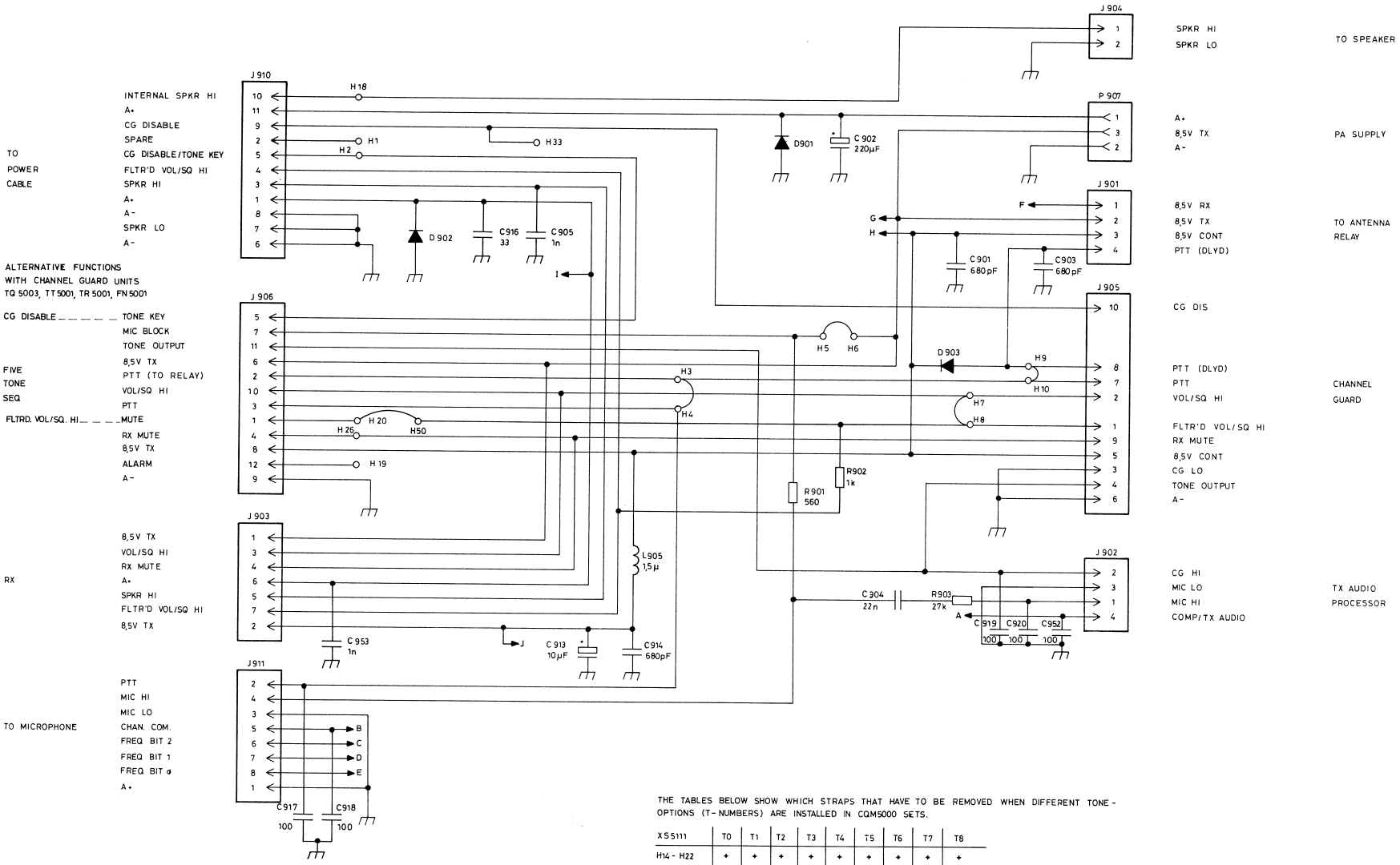
TYPE	Nº	CODE	DATA

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.

XS5111	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	+	–	–	–	–	+	+	+	+

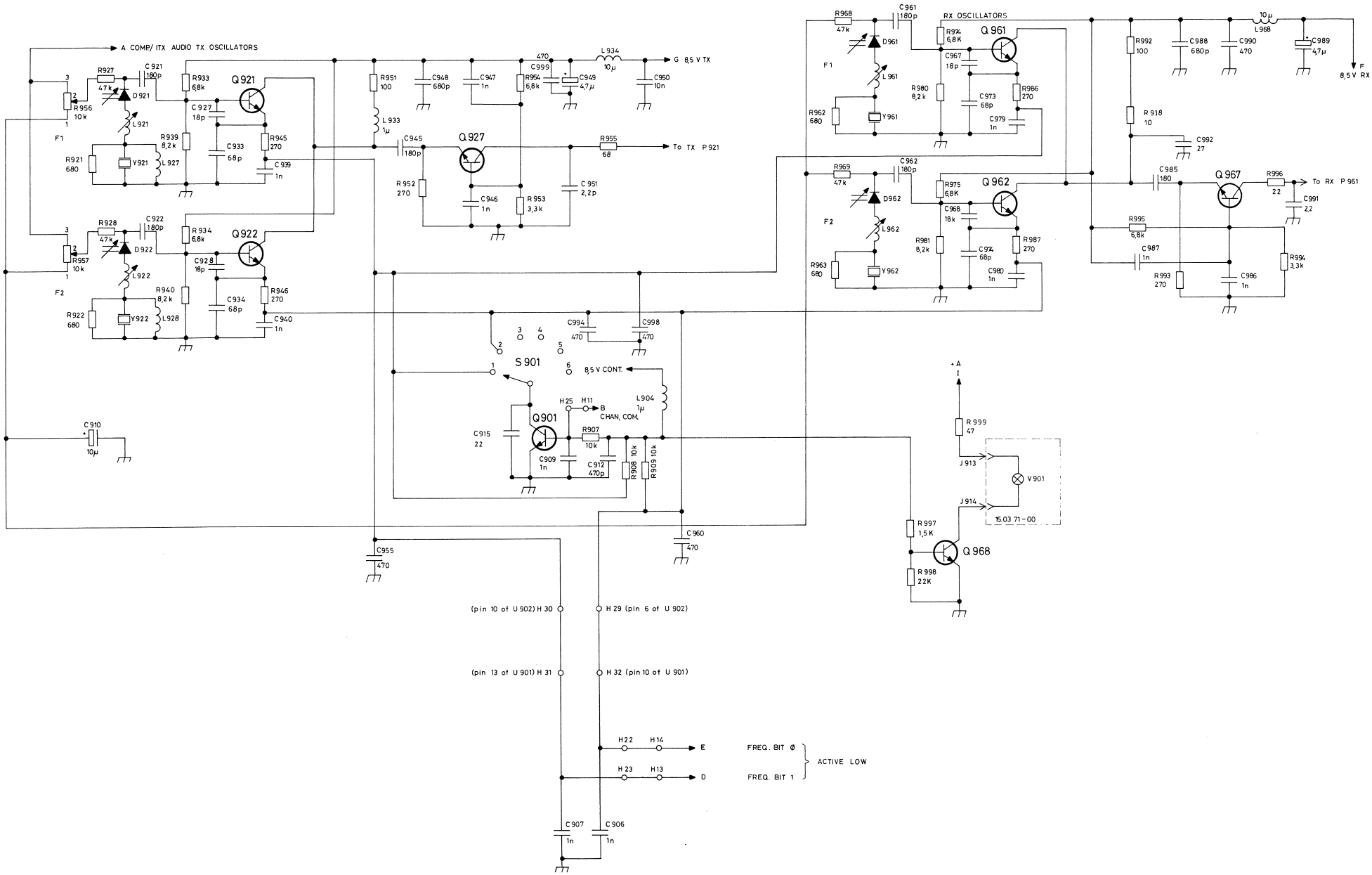
CHANNEL SELECTOR UNIT

XS 5111

D402.635

Storno

Storno

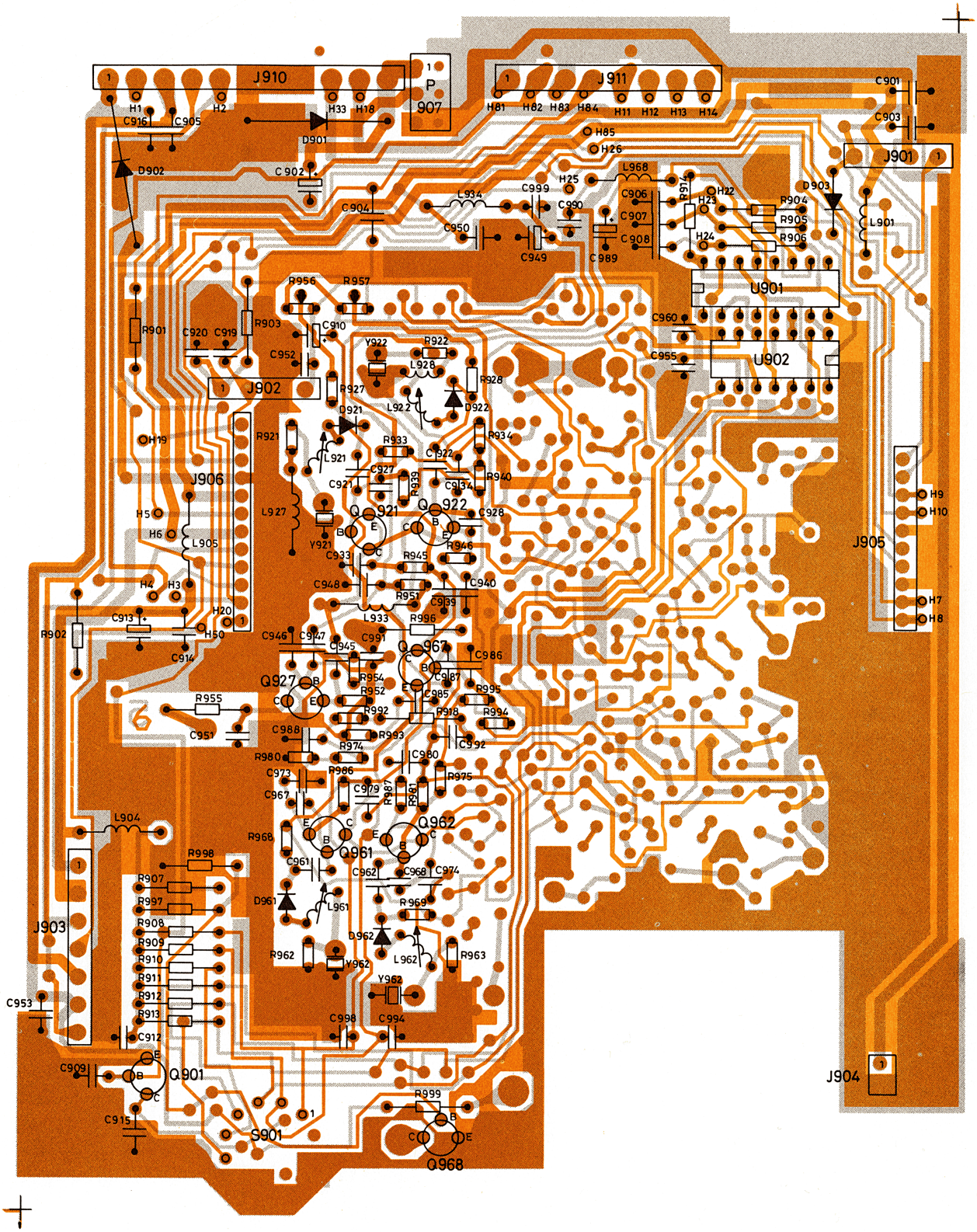


CHANNEL SELECTOR UNIT XS 5111
OSCILLATOR SECTION

D402.616

Storno

Storno



CHANNEL SELECTOR UNIT XS 5111
INTERCONNECTION SECTION

D402.617/3

TYPE	Nº	CODE	DATA	
	C612	74.5395	470pF 5% Ceram DI	50V
	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
	C909	74.5397	1nF 20% Ceram DI	50V
	C910	73.5173	10uF 20% Tantal	16V
	C911	74.5397	1nF 20% Ceram DI	50V
	C913	73.5173	10uF 20% Tantal	16V
	C914	74.5396	680pF 20% Ceram DI	50V
	C915	74.5375	22pF 5% Ceram DI	50V
	C917	74.5391	100 pF 20% Ceramic DI	50V
	C918	74.5391	100 pF 20% Ceramic DI	50V
	C921	74.5386	180pF 5% Ceram DI	50V
	C922	74.5386	180pF 5% Ceram DI	50V
	C927	74.5403	18pF 5% Ceram DI	50V
	C928	74.5403	18pF 5% Ceram DI	50V
	C933	74.5405	68pF 5% Ceram DI	50V
	C934	74.5405	68pF 5% Ceram DI	50V
	C939	74.5397	1nF 20% Ceram DI	50V
	C940	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
	C950	76.5135	10nF 10% Polyest FL	50V
	C951	74.5363	2.2 pF 0.25 pF Ceramic DI	50V
	C961	74.5386	180pF 5% Ceram DI	50V
	C962	74.5386	180pF 5% Ceram DI	50V
	C967	74.5403	18pF 5% Ceram DI	50V
	C968	74.5403	18pF 5% Ceram DI	50V
	C973	74.5405	68pF 5% Ceram DI	50V
	C974	74.5405	68 pF 5% Ceramic DI	50V
	C979	74.5397	1nF 20% Ceram DI	50V
	C980	74.5397	1 nF 20% Ceramic 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	

Storno

TYPE	Nº	CODE	DATA	
	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	41.0227	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
	L902	61.5029	1.0 uH RF choke	
	L904	61.5029	1.0 uH RF choke	
	L921	61.5032	48-58 MHz RF coil	
	L922	61.5032	48-58 MHz RF coil	
	L927	61.5030	1.5 uH RF choke	
	L928	61.5030	1.5 uH RF choke	
	L933	61.5029	1.0 uH RF choke	
	L934	61.5031	10 uH RF choke	
	L961	61.5034	45-55 MHz RF coil	
	L962	61.5034	45-55 MHz RF coil	
	L967	61.5029	1.0 uH RF choke	
	L968	61.5031	10 uH RF choke	
	P921	41.5550	Male connector	1 pin
	P961	41.5550	Male connector	1 pin
	Q901	99.5121	BC237 Transistor	
	Q921	99.5294	PN2369 Transistor	
	Q922	99.5294	PN2369 Transistor	
	Q927	995294	PN2369 Transistor	
	Q961	99.5294	PN2369 Transistor	
	Q962	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
	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
	R918	80.8225	10 ohm 5% Carbon film	0.125W

CHANNEL SWITCH XS5111

X402.647

TYPE	Nº	CODE	DATA
	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
	R927	80.5269	27 Kohm 5% Carbon film 0.125W
	R928	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
	R939	80.5260	8.2 Kohm 5% Carbon film 0.125W
	R940	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
	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
	R962	80.5247	680 ohm 5% Carbon film 0.125W
	R963	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
	R974	80.5261	10 Kohm 5% Carbon film 0.125W
	R975	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
	R986	80.5242	270 ohm 5% Carbon film 0.125W
	R987	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

Storno

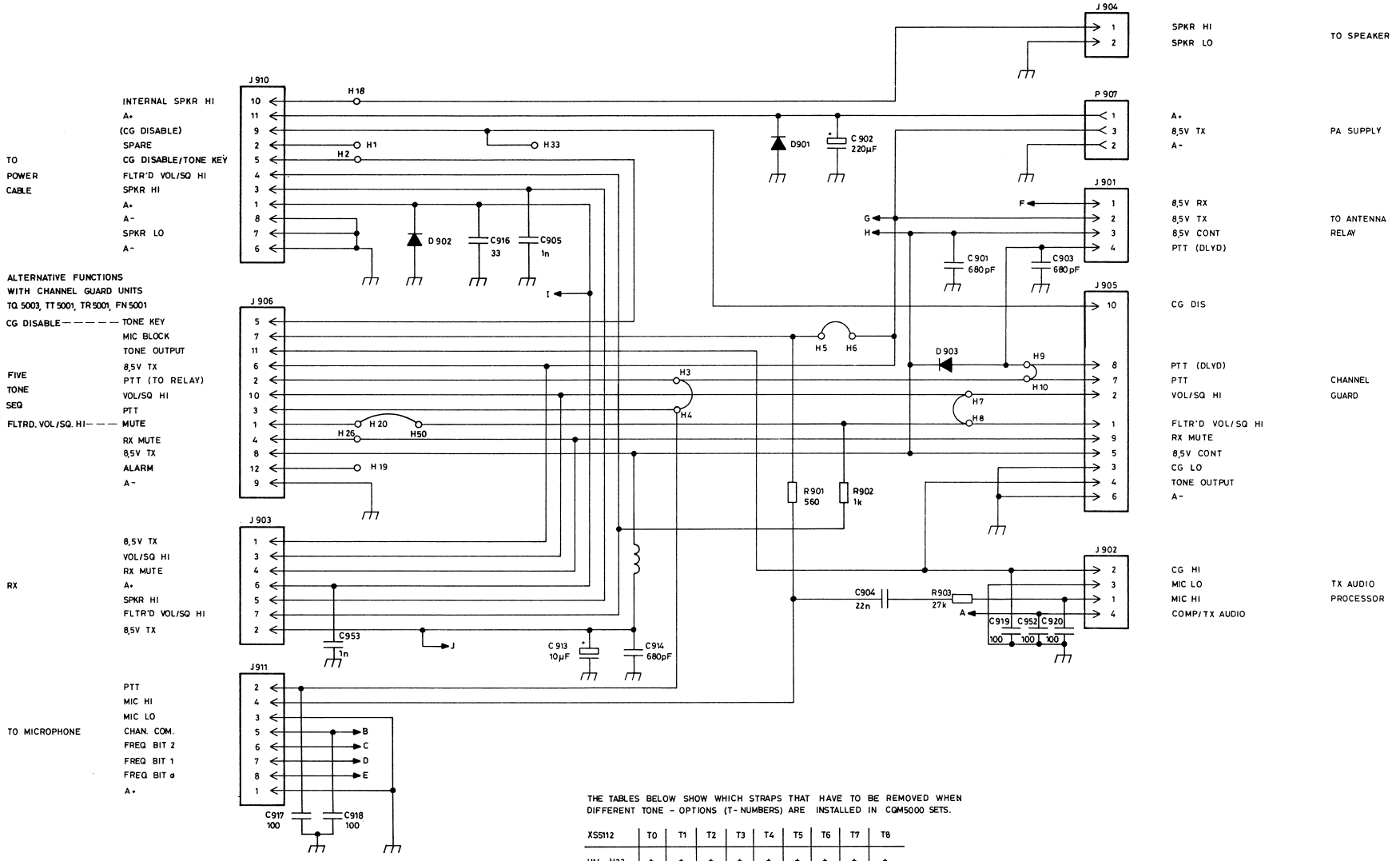
TYPE	Nº	CODE	DATA

CHANNEL SWITCH XS5111

X402.647

Storno

Storno



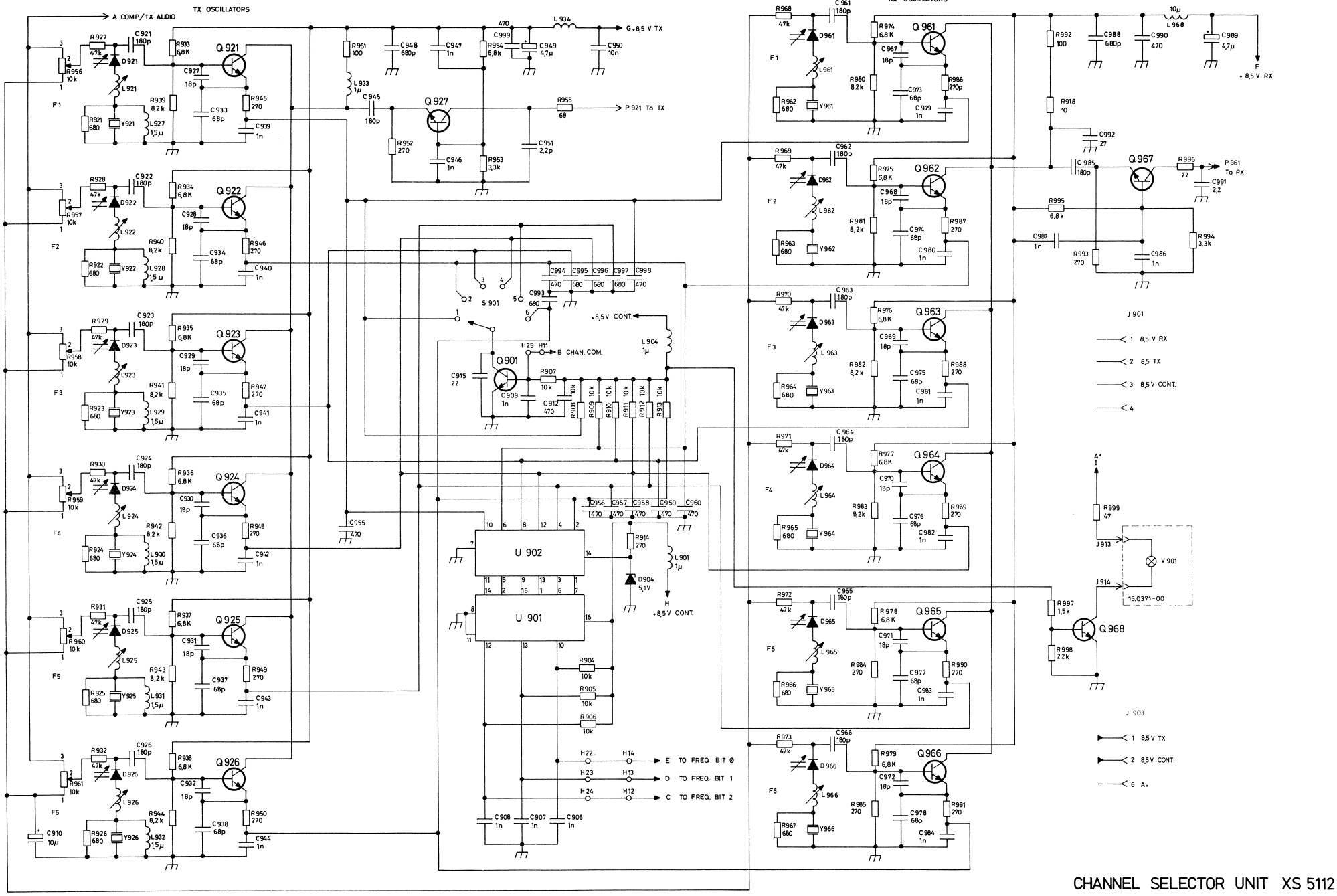
THE TABLES BELOW SHOW WHICH STRAPS THAT HAVE TO BE REMOVED WHEN DIFFERENT TONE – OPTIONS (T- NUMBERS) ARE INSTALLED IN CQM5000 SETS.

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

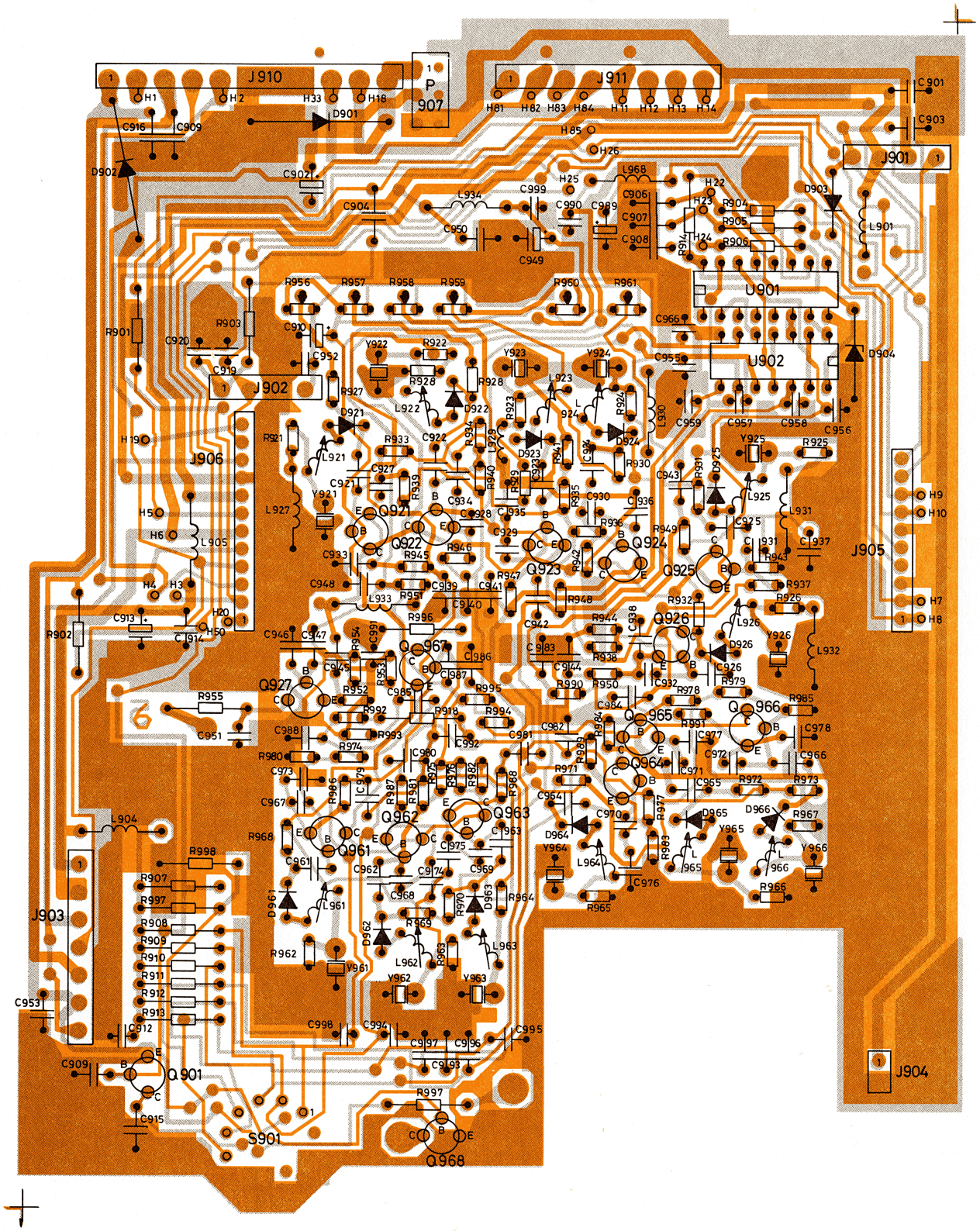


CHANNEL SELECTOR UNIT XS 5112
OSCILLATOR SECTION

D402.618

Storno

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

Storno

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	

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

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

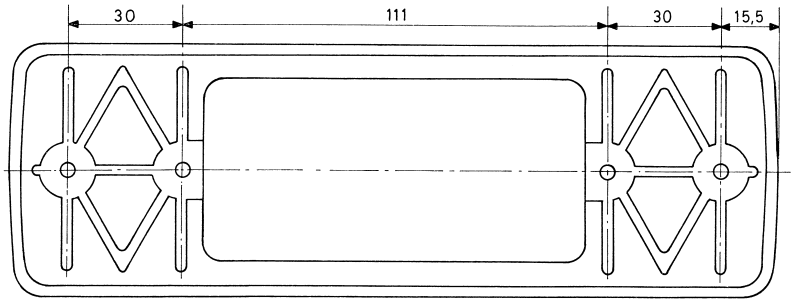
Storno

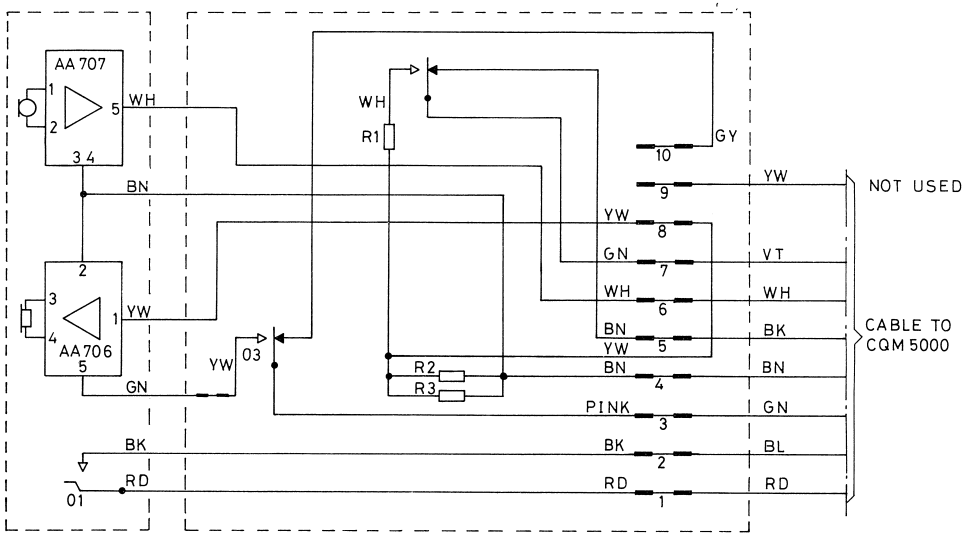
TYPE	Nº	CODE	DATA
	R988	80.5242	270 ohm 5% Carbon film 0.125W
	R989	80.5242	270 ohm 5% Carbon film 0.125W
	R990	80.5242	270 ohm 5% Carbon film 0.125W
	R991	80.5242	270 ohm 5% Carbon film 0.125W
	R992	80 5237	100 ohm 5% Carbon film 0.125W
	R993	80.5242	270 ohm 5% Carbon film 0.125W
	R994	80.5255	3.3 Kohm 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

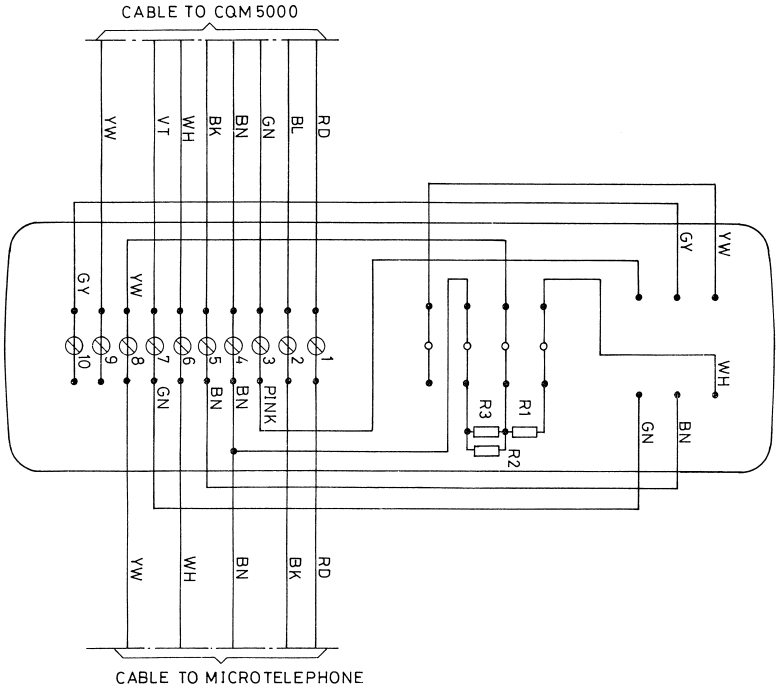
CHANNEL SWITCH XS5112

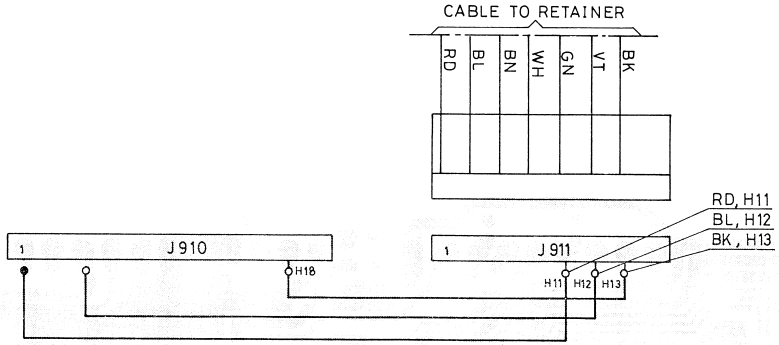
X402, 646

Storno









INSTALLATION DIAGRAM MT5001
MICROTELEPHONE WITH RETAINER

D402.880

Nº	CODE	DATA	
MT5001	96.0105-00	HANDSET, COMPLETE	
	18.0760-01	Cable	
SUBASS.	96.5087-00	HANDSET/MICROTELEPHONE	
	10.3616-00	AA706, Telephone Amplifier	
	10.3617-00	AA707, Microphone Amplifier	
	32.0486-00	Suspension f. telephone	
	32.0486-00	Suspension f. microphone	
	52.0077-00	Netting f. telephone	
	52.0077-00	Netting f. microphone	
	96.5076-00	Cartridge, telephone	
	96.5079-00	Cartridge, microphone	
	177.5013-00	Spiral wire	
SUBASS.	96.5088-01	RETAINER WITH SWITCH	
R1	80.5263-00	15 Kohm 5%, Carbon film	1/8 W
R2	80.5245-00	470 ohm 5%, Carbon film	1/8 W
R3	80.5249-00	1 Kohm 5%, Carbon film	1/8 W
	20422-03913	Screw 3.9 x 13 mm	
	10.3616-00	AA706	
C1	73.5114	1 uF 20%, Tantal	35 V
C2	74.5345	1 uF 10%, Ceram 2PL	65 V
C3	73.5126	4.7 uF 20%, Tantal	35 V
R1	80.5261-00	10 Kohm 5%, Carbon film	1/8 W
R2	80.5255-00	3.3 Kohm 5%, Carbon film	1/8 W
R3	80.5259-00	6.8 Kohm 5%, Carbon film	1/8 W
R4	80.5249-00	1 Kohm 5%, Carbon film	1/8 W
R5	80.5243-00	330 ohm 5%, Carbon film	1/8 W
E1	99.5209-00	Diode, Stabilizing, 1.5 V.	
Q1	99.5143	Transistor BC238	
Q2	99.5230	Transistor BC308	

Storno

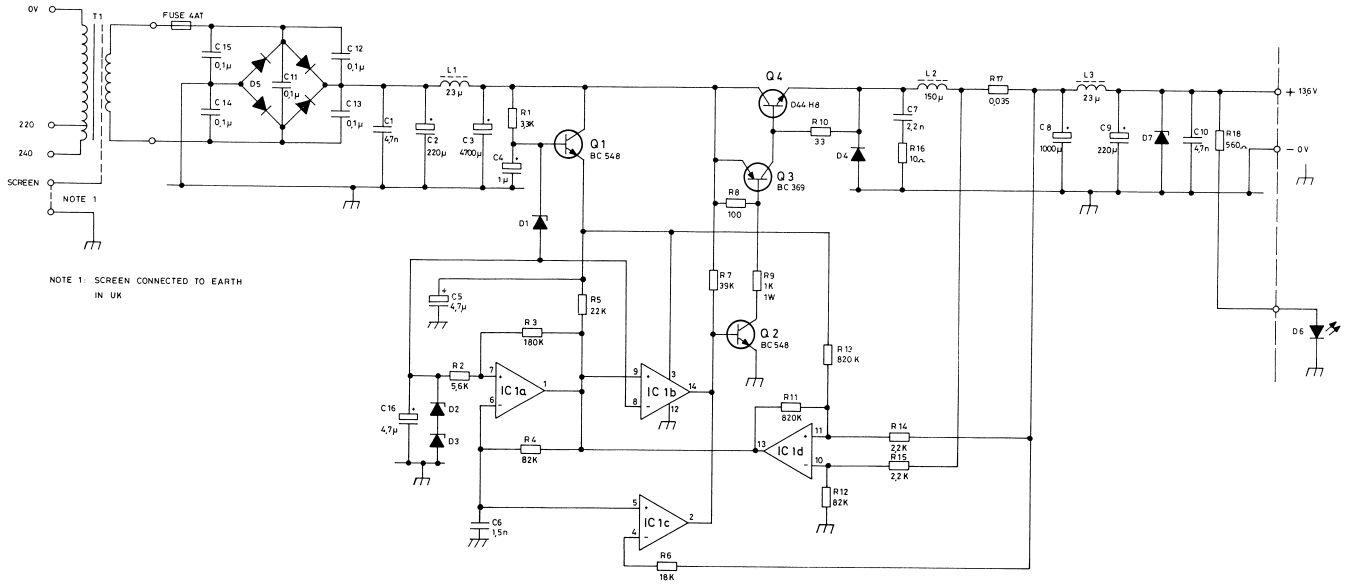
Nº	CODE	DATA	
	10.3617-00	AA707	
C1	73.5102	2.2 uF 20%, Tantal	35 V
C2	74.5186	47 pF 10%, Ceram N750PL	25 V
C3	74.5186	47 pF 10%, Ceram N750PL	25 V
R1	80.5261-00	10 Kohm 5%, Carbon film	1/8 W
R2	80.5239-00	150 Kohm 5%, Carbon film	1/8 W
R3	80.5251-00	1.5 Kohm 5%, Carbon film	1/8 W
R4	80.5271-00	68 Kohm 5%, Carbon film	1/8 W
R5	80.5247-00	680 ohm 5%, Carbon film	1/8 W
Q1	99.5143	Transistor BC238	
Q2	99.5230	Transistor BC308	

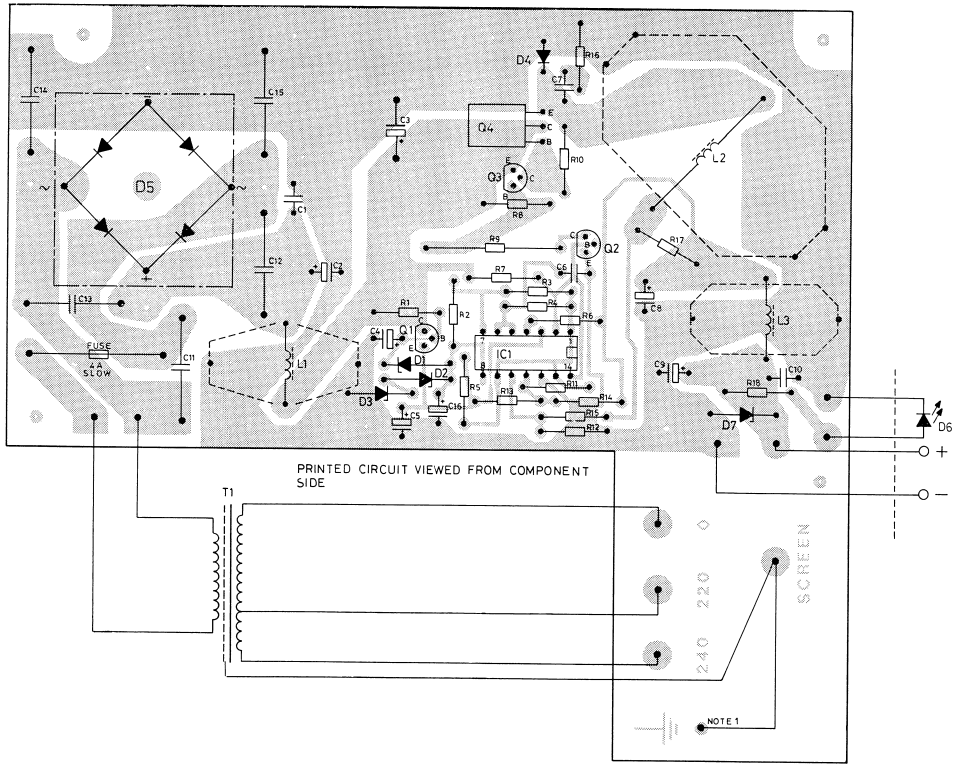
HANDSET MT5001

X402.939

Storno

Storno





POWER SUPPLY PS5001

D402.713/3

Storno

Nº	CODE	DATA	
C 1	74.5401	4700pF 10% Ceram DI	50V
C 2	73.5178	220uF -10 +100% Elco	40V
C 3	73.5155	4700uF -10 +50% Elco	40V
C 4	73.5170	1uF 20% Tantal	35V
C 5	73.5172	4.7uF 20% Tantal	35V
C 6	76.5130	1.5nF 10% Polyester FL	50V
C 7	74.5399	2200pF 20% Ceram DI	50V
C 8	73.5179	1000uF -10 +100% Elco	16V
C 9	73.5165	220uF -10 +100% Elco	25V
C 10	74.5401	4700pF 10% Ceram DI	50V
C 11	76.5073	0.1uF 10% Polyest TB	100V
C 12	76.5073	0.1uF 10% Polyest TB	100V
C 13	76.5073	0.1uF 10% Polyest TB	100V
C 14	76.5073	0.1uF 10% Polyest TB	100V
C 15	76.5073	0.1uF 10% Polyest TB	100V
C 16	73.5172	4.7uF 20% Tantal	35V
D 1	99.5224	4.7V 5% Zenerdiode	0.4W
D 2	99.5146	6.8V 5% Zenerdiode	0.4W
D 3	99.5146	6.8V 5% Zenerdiode	0.4W
D 4	99.5371	BYW29-150 Diode	
D 5	99.5174	10A Rectifier bridge	100V
D 6	99.5303	LED red	1.6 V/20 mA
D 7	99.5334	16V 5% Zenerdiode	1W
F1	92.5094	4A Fuse, slow	
L 1	61.1419	Choke	
L 2	61.1420	Choke	
L 3	61.1419	Choke	
Q 1	99.5143	BC548 Transistor	
Q 2	99.5143	BC548 Transistor	
Q 3	99.5337	BC369 Transistor	
Q 4	99.5372	D44H.8 Transistor	
R 1	80.5265	22Kohm 5% Carbon film	1/8W
R 2	80.5258	5.6Kohm 5% Carbon film	1/8W
R 3	80.5276	180Kohm 5% Carbon film	1/8W
R 4	80.5272	82Kohm 5% Carbon film	1/8W
R 5	80.5265	22Kohm 5% Carbon film	1/8W
R 6	80.5264	18Kohm 5% Carbon film	1/8W
R 7	80.5268	39Kohm 5% Carbon film	1/8W
R 8	80.5237	100ohm 5% Carbon film	1/8W
R 9	82.5049	1Kohm 5% Carbon film	1W
R 10	80.5231	33ohm 5% Carbon film	1/8W
R 11	80.5284	820Kohm 5% Carbon film	1/8W
R 12	80.5272	82Kohm 5% Carbon film	1/8W
R 13	80.5284	820Kohm 5% Carbon film	1/8W
R 14	80.5253	2.2Kohm 5% Carbon film	1/8W
R 15	80.5253	2.2Kohm 5% Carbon film	1/8W

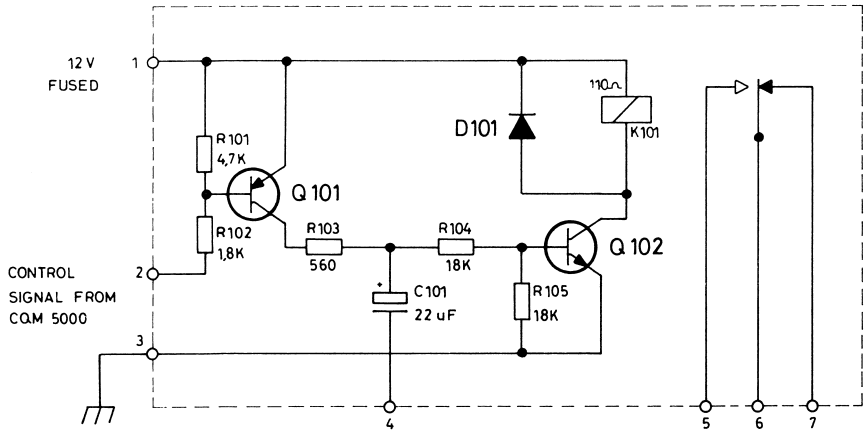
Storno

Nº	CODE	DATA	
R 16	80.5225	10ohm 5% Carbon film	1/8W
R 17	89.0026	0.035ohm Resistor Constantan	
R 18	80.5246	560ohm 5% Carbon film	1/8W
T 1	60.5170	Main transformer	
U 1	14.5019	MC3302P Quad comparator	

POWER SUPPLY PS5001

X402.821/1

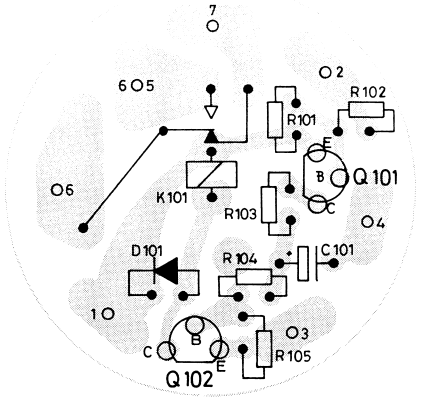
Storno



GROUND FOR DELAY

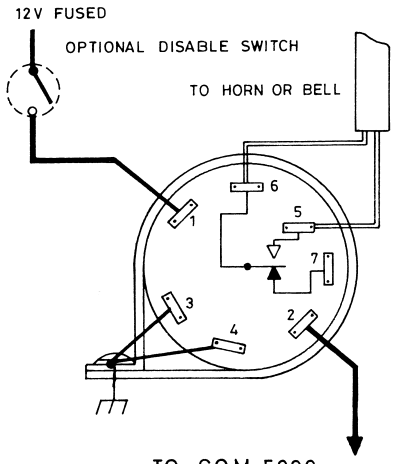
BOTTOM VIEW

Storno



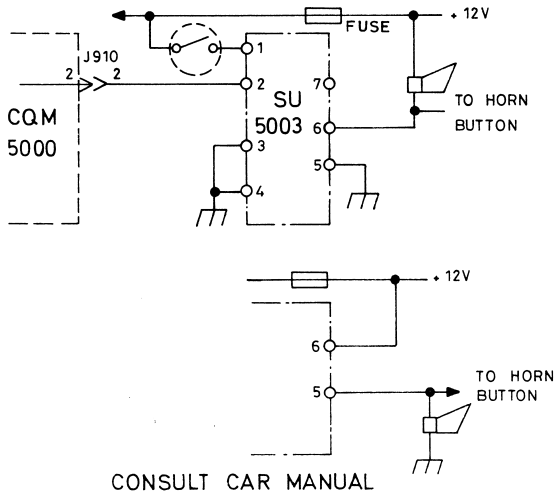
PRINTED CIRCUIT VIEWED FROM
SOLDER SIDE

ALARM (HORN, BELL)



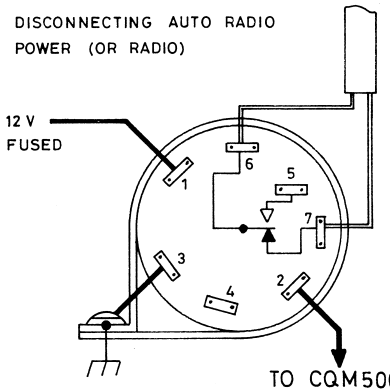
TO CQM 5000
CONNECTOR J910 - PIN 2

NOTES: STRAP H1 - H19 ON XS5000.
THE HORN ALARM MAY BE
SWITCHED OFF BY A SWITCH
IN SERIES WITH 12V FUSED



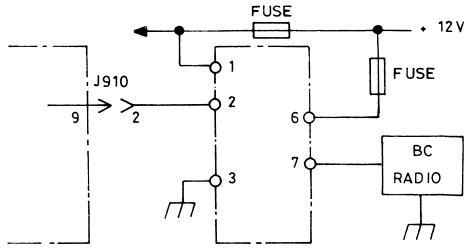
CONSULT CAR MANUAL
FOR HORN SCHEMATIC

DISCONNECTING AUTO BROADCAST RADIO



TO CQM5000
CONNECTOR J910
PIN 9

NOTES: STRAP H20 - H33 ON XS5000.
J910 - PIN 9 IS NOT FREE IF
A CHANNEL GUARD / PILOT TONE
UNIT IS CONNECTED TO J905.
J911 PIN 6 MAY BE USED IN
THESE CASES (REMOVE STRAP
H12 - H24 IF ANY) AND STRAP
H20 - H12.



SWITCHING UNIT SU5003

D402.725

Storno

TYPE	Nº	CODE	DATA	
	C101	73.5174	22uF, 20%, Tantal	16 V
	D101	99.5237	1N4148, Diode	
	FB102	65.5102	Ferrite bead	
	FB103	65.5102	Ferrite bead	
	FB103	65.5102	Ferrite bead	
	K101	58.5083	12 V Relay, 110 ohm,	
	Q101	99.5365	MPS-A13, Transistor	
	Q102	99.5251	BC307, Transistor	
	R101	80.5249	1 Kohm, 5%, Carbon film	0.125 W
	R102	80.5252	1.8 Kohm, 5%, Carbon film	0.125 W
	R103	80.5246	560 ohm, 5%, Carbon film	0.125 W
	R104	80.5264	18 Kohm, 5%, Carbon film	0.125 W
	R105	80.5264	18 Kohm, 5%, Carbon film	0.125 W

Storno

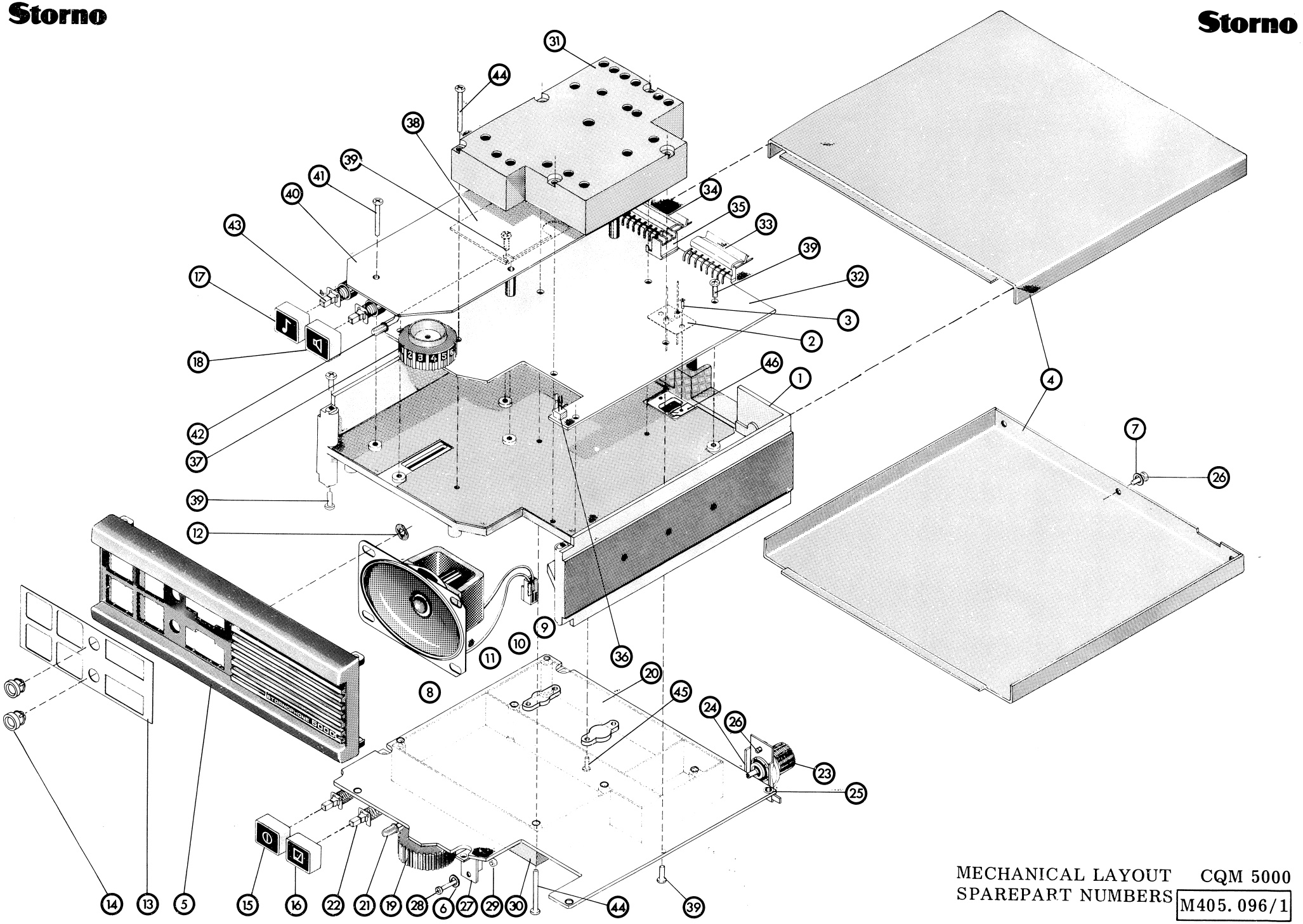
TYPE	Nº	CODE	DATA

SWITCHING UNIT SU5003

X402.710/2

Storno

Storno



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 Américain
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	2432-095040	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 (américain.)
13	51.1160-01	Nameplate } Eur. Version
	51.1161-01	Nameplate } Plaque europ.
	51.1164-01	Nameplate }
	51.1165-01	Nameplate }
	51.1169-01	Nameplate } U.S. version
	51.1170-01	Nameplate } Plaque américain.
	51.1173-01	Nameplate }
	51.1174-01	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 américain.

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 américain.
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 américain.
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. américain.
19	49.0267-00	Knob volume control Eur. Bouton de volume europ.
	49.0281-00	Knob volume control U.S. Bouton de volume américain.
		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 américc.
31	12.0361-00	Shield Multifreq. Ecran multifreq.
32	10.3737-00 10.3738-00 10.3739-00	Channel selector unit XS5001 Channel selector unit XS5002 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 10.3746-00	Switching unit SU5001 Switching unit SU5002
39	20562-03008	Screw M3x8 mm Vis M3x8 mm
40	10.3743-00 10.3744-00	Tone transmitter/receiver TQ5001 Emetteur-récepteur de tonalité TQ5001 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 **Storno**

* ONE CHANNEL ** MORE THAN ONE CHANNEL

CQM 5000 TONE EQUIPMENT T. No.	KIT WITH NAMEPLATE AND BUTTON: ONE CHANNEL 17.0116-00Eur. 17.0122-00 US.	ONE CHANNEL 17.0120-00Eur. 17.0126-00 US.	MORE THAN ONE CHANNEL 17.0117-00Eur 17.0123-00 US.	MORE THAN ONE CHANNEL 17.0121-00Eur. 17.0127-00 US.	NAME PLATE Eur. 51.1160-00 *	51.1164-00 *	51.1161-00 **	51.1165-00 **	NAME PLATE US. 51.1169-00 *	51.1173-00 *	51.1170-00 **	51.1174-00 **	BUSHING Eur. & US. 32.0512-00	KNOB VOL. 49.0267-00Eur. 49.0281-00 US.	PUSH BUTTON ON/OFF 49.0271-00Eur. 49.0275-00 US.	SQ. 49.0272-00Eur 49.0276-00 US.	TONE KEY 49.0273-00Eur. 49.0277-00 US.	LS. IN/OUT 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	
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 anti further notice is given.

EXAMPLE: CQM 5112 Spec. 25×6 T21 → COMBINATIONS OF TONE EQUIPMENT
WATT ← → NUMBER OF CHANNELS

CHOICE OF NAMEPLATE KIT AND PUSH BUTTON

M405.096-4