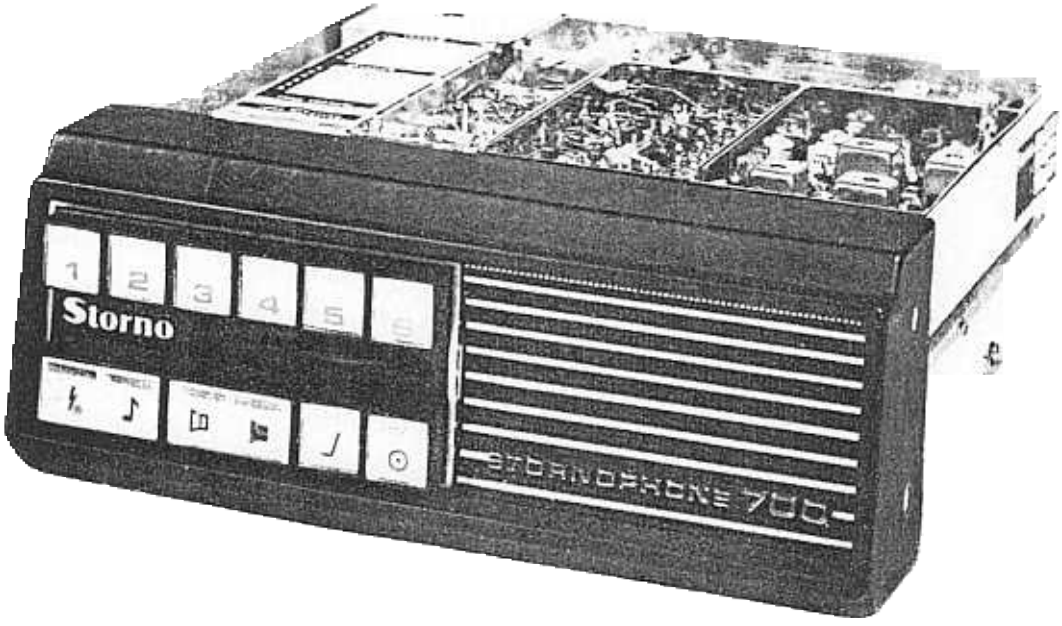
MOBILE RADIOTELEPHONE
MODEL STORNOPHONE 700
TYPE CQM713
TYPE CQM714
146-174 MHz

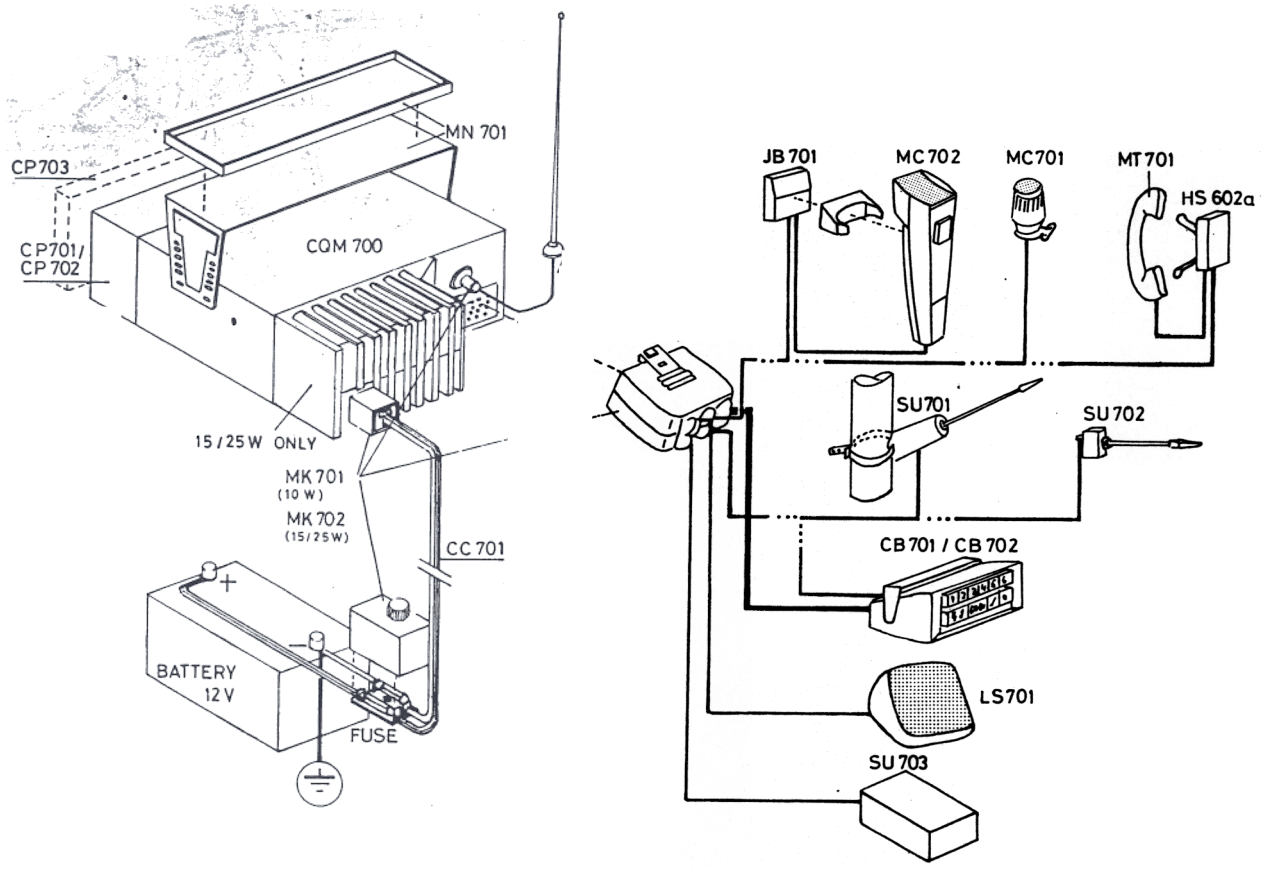
Storno



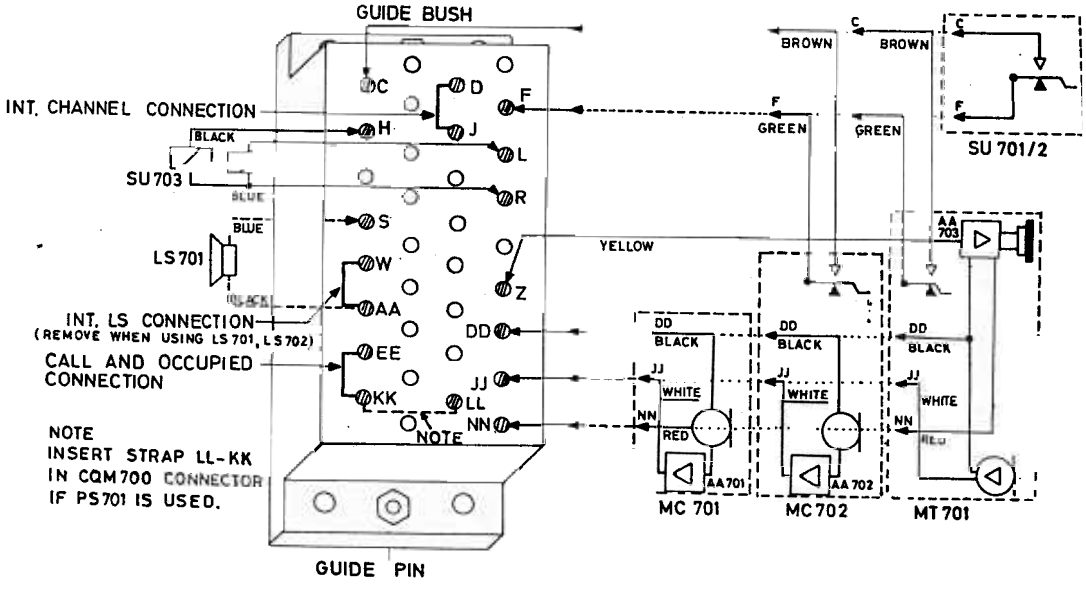
MOBILE RADIOTELEPHONE CQM700

60.138-E1

CONNECTING ACCESSORIES TO CQM700

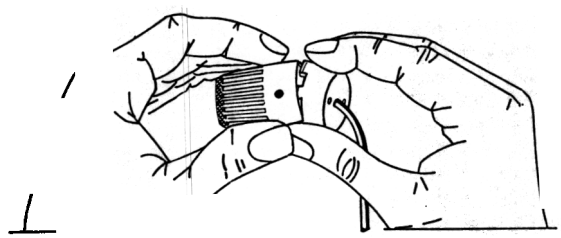


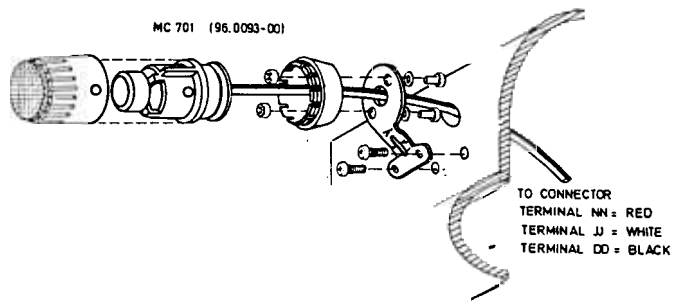
ACCESSORY CONNECTIONS TO MULTI-WIRE CONNECTOR IN CQM700



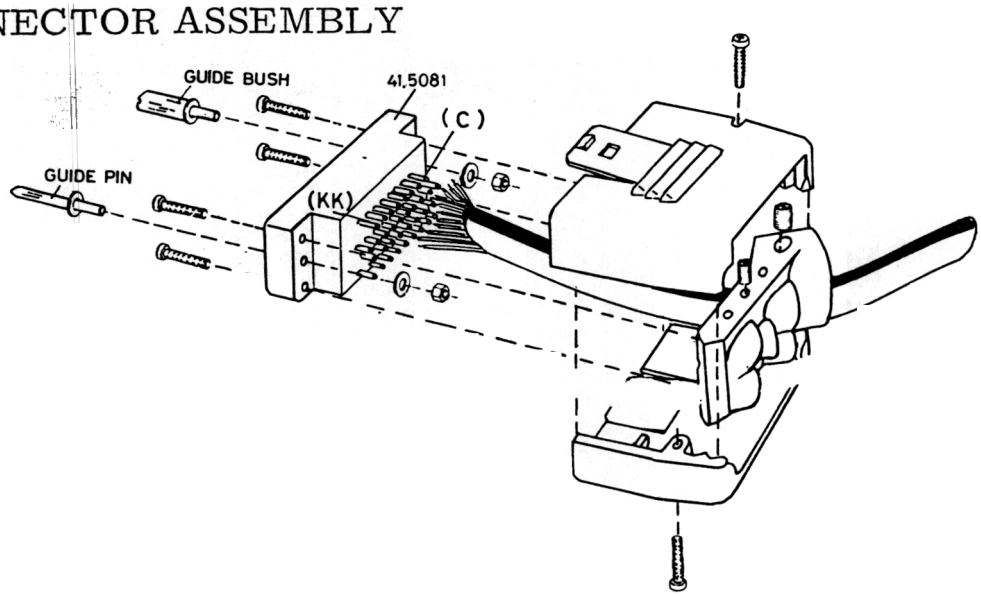
Storno

DISASSEMBLING MICROPHONE MC701

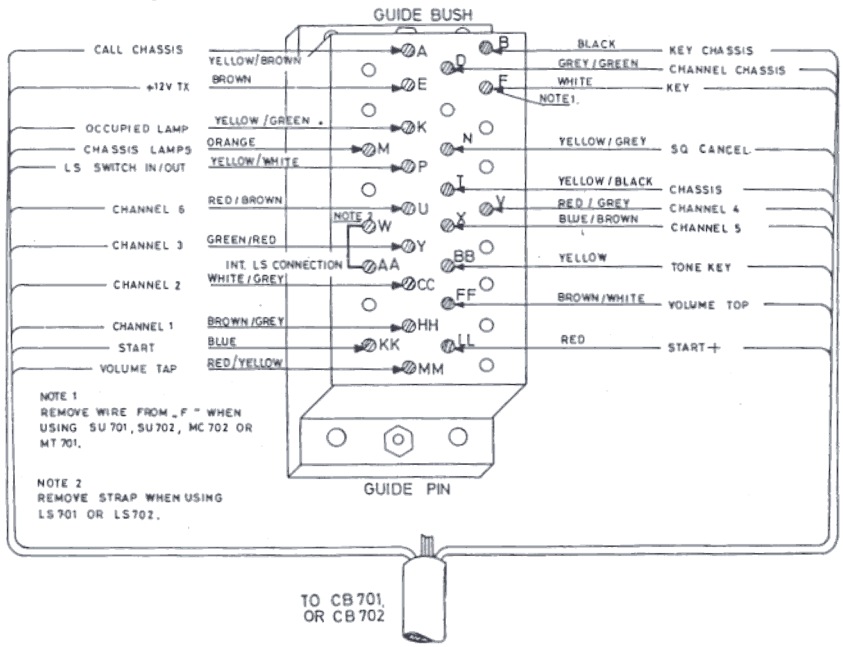




CONNECTOR ASSEMBLY



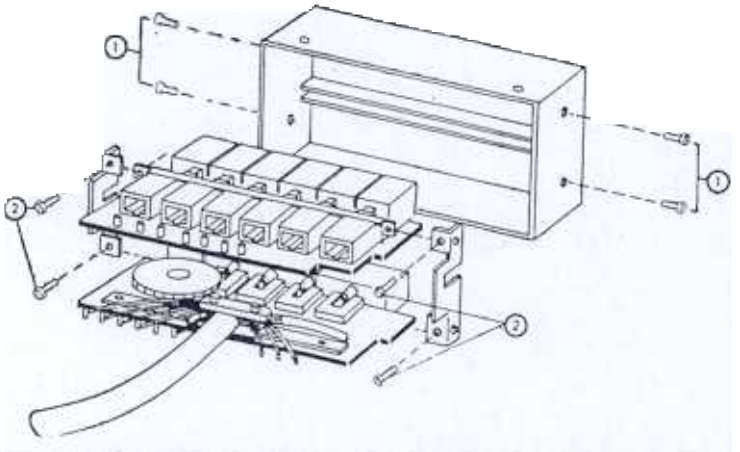
CONNECTING CB700 CONTROL CABLE TO MULTIWIRE-WIRE CONNECTOR IN CQM700

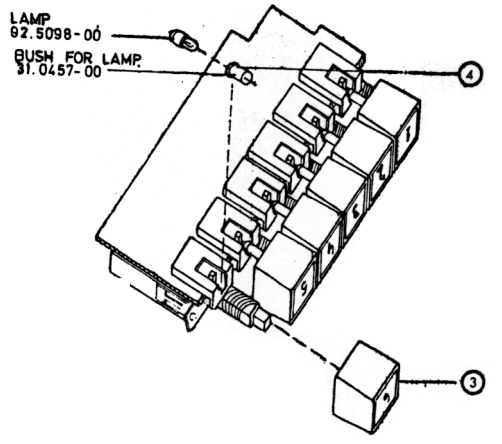


60.205-E3

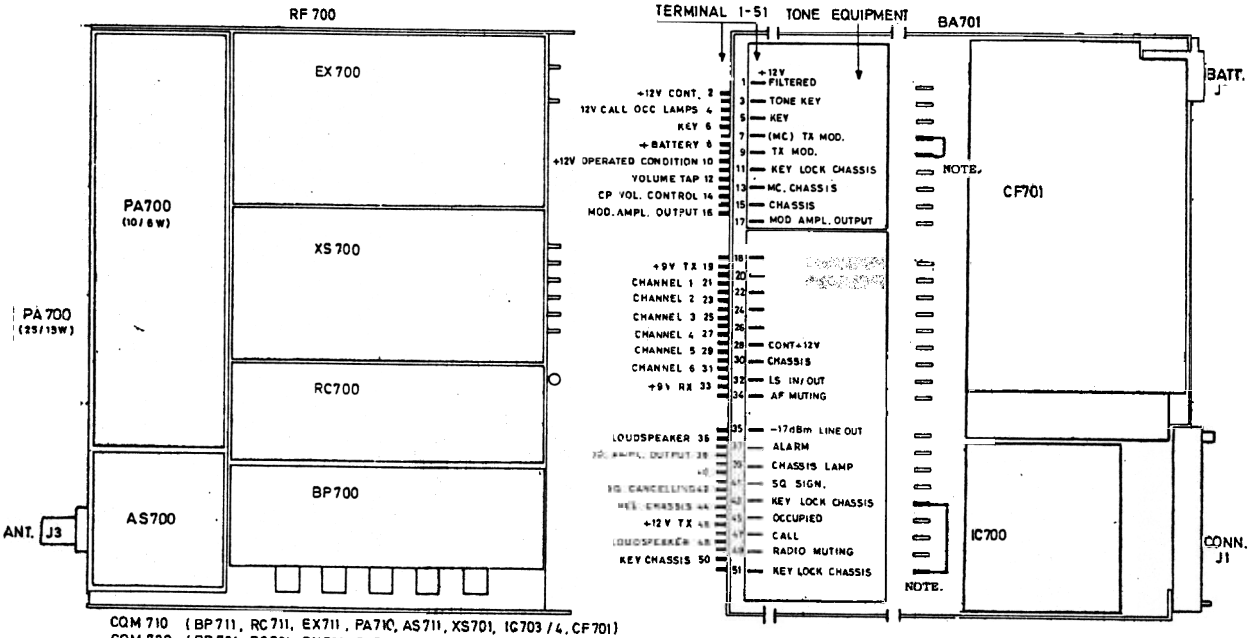
Storno

REPLACING INDICATOR LAMPS





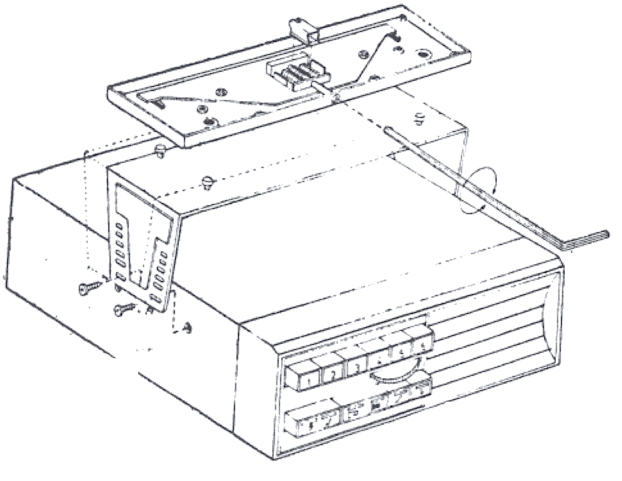
MODULE LAY-OUT CQM700



CQM 710 (BP711, RC711, EX711 , PA710, AS711, XS701, IC703 /4, CF701)
CQM 730 (BP731, RC731, EX731, PA730, AS731, XS701, IC703/4, CF701)
CQM 760 (BP761, RC761, EX761, PA760, AS761, XS700, IC701/3, CF701)

NOTE. STRAP ARE INSERTED IN RADIOTELEPHONES WITHOUT TONE EQUIPMENT
NOTE. STRAPNING ANVENDES KUN I RADIOTELEFON UDEN TONEUDSTYR

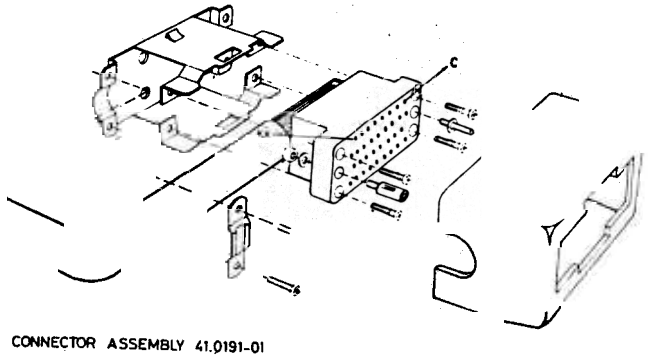
MOUNTING FRAME MN701



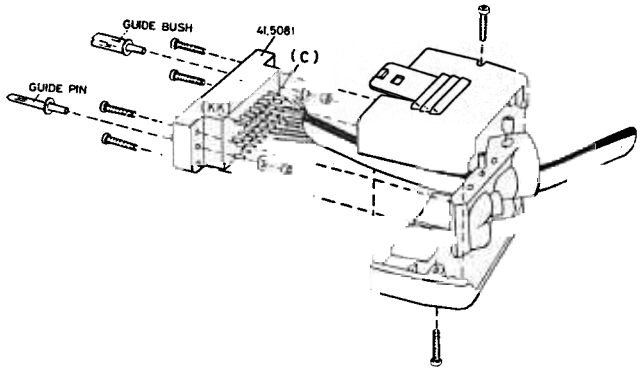
Mounting Frame type MN701 is designed for installing CQM700 equipment. The holes in the Mounting Frame are so arranged that they allow for a total of 36 mounting positions.
With an Allen wrench, adjust the Safety Lock to the point where it will release the CQM cabinet when bumped or jarred in a traffic accident.
Where the Mounting Frame is installed in a lorry or other vehicle that is exposed to shocks greater than 5 g, the Safety Lock should be blocked by inserting the clip "A" as shown in the illustration.

Storno

CONNECTOR AND EXTENTION CABLE ASSEMBLY CC703

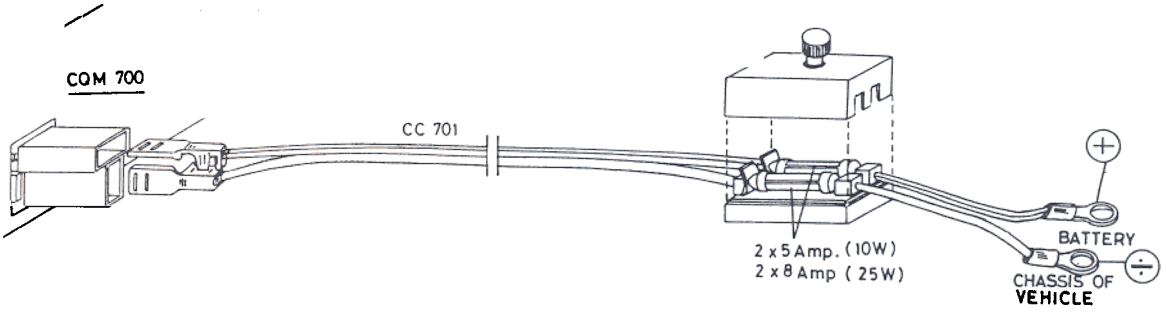


CONNECTOR ASSEMBLY 41.0191-01

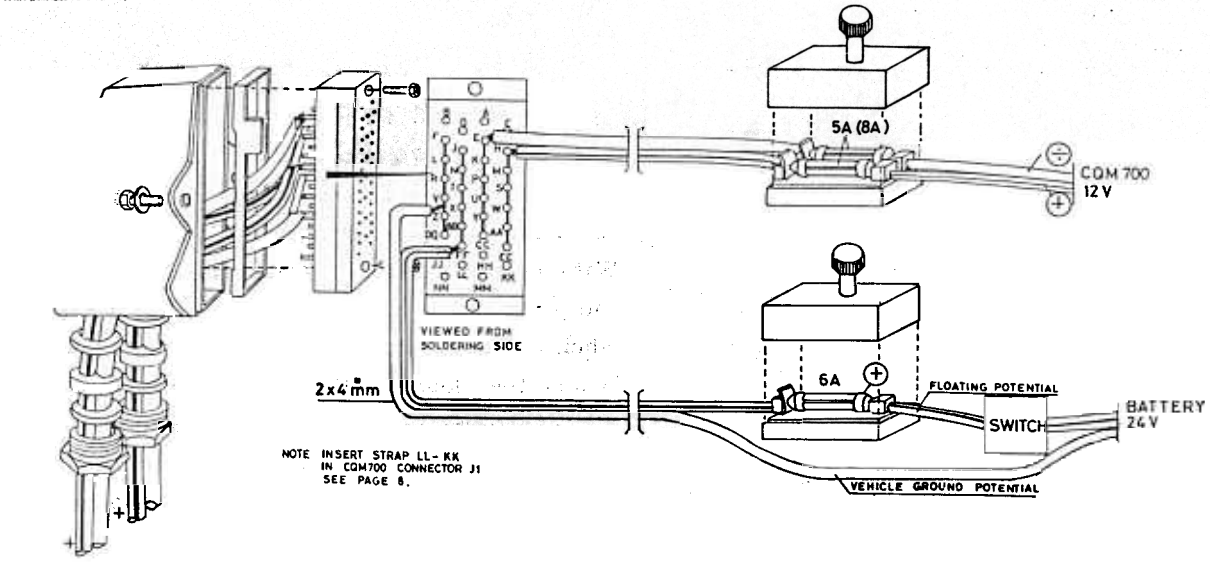


Terminal A	Yellow/Brown	Terminal V	Grey/Red
Terminal B	Black	Terminal W	White/Red
Terminal C	Blue/Red	Terminal X	Blue/ Brown
Terminal D	Green-Grey	Terminal Y	Green/Red
Terminal E	Brown	Terminal Z	Green/White
Terminal F	White	Terminal AA	Grey
Terminal H	Black/Red	Terminal BB	Yellow
Terminal J	Black/Green	Terminal CC	Grey/White
Terminal K	Yellow/Green	Terminal DD	Green/Brown
Terminal L	Blue/Green	Terminal EE	Blue/Yellow
Terminal M	Orange	Terminal FF	Brown/White
Terminal N	Yellow/Grey	Terminal HH	Brown/Grey
Terminal P	Yellow/White	Terminal JJ	Green
Terminal R	White/Blue	Terminal KK	Blue
Terminal S	Violet	Terminal LL	Red
Terminal T	Black/Yellow	Terminal MM	Red/Yellow
Terminal U	Red/Brown	Terminal NN	Blue/Grey

BATTERY CABLE FOR 12V INSTALLATIONS



WIRING OF CONNECTOR TO PS701 FOR 24V INSTALLATIONS



Storno

CQM710
GENERAL SPECIFICATIONS

Unless otherwise stated, specifications are based on the measuring methods prescribed in EIA publications RS152A and RS204. Storno reserves the right to change the listed specifications without notice. Figures given in brackets are guaranteed values.

Frequency Range
146 - 174 MHz

Min. Channel Separation
CQM713: 20 kHz or 25 kHz
CQM714: 12.5 kHz

Max. Frequency Deviation
CQM713: ± 4 kHz or ± 5 kHz
CQM714: ± 2.5 kHz

Frequency Stability
Meets government specifications

Max. VHF Bandwidth
1 MHz

Number of Channels
Max. 6

Antenna Impedance
50 Ω

Temperature Range
Operating range: -25° - $+50^{\circ}$C
Functioning range: -30° - $+60^{\circ}$C

Dimensions
Locally controlled version: 180 x 190 x 68 mm
Extended local control: 180 x 160 x 68 mm
Control unit CB700: 118 x 65 x 55 mm

Weight
Locally controlled version: 2.1 Kg
Extended local control: 1.9 Kg
Control unit CB700: 0.2 Kg

TRANSMITTER SPECIFICATIONS

RF Power Output
10 W or 6 W (adjustable)

Type of Modulation
Phase

AF Response
6 dB/octave preemphasis
CQM713: 300-3000 Hz
+0/−1.5 dB (+0.5/−3 dB)
CQM714: 300-2500 Hz
+0/−1.5 dB (+0.5/−3 dB)

Modulation Distortion (measured with deemphasis)
3% (5%)

Modulation Sensitivity
220 mV e.m.f. (600 Ω) ± 2 dB

AF Input Impedance
560 Ω

Adjacent Channel Selectivity
Attenuated to meet government specifications

FM Hum and Noise (measured without deemphasis)
CQM713: 50 dB (40 dB)
CQM714: 45 dB (38 dB)

Spurious Radiation (FTZ)
Less than 0.2 μW

Harmonic Radiation (FTZ)
Less than 0.2μW (2μW)

Storno

RECEIVER SPECIFICATIONS

Sensitivity e.m.f. for 12 dB SINAD EIA
0.6 µV (0.9 µV)

Squelch
Electronic, adjustable

Adjacent Channel Selectivity EIA
CQM713: 90 dB (80 dB)
CQM714: 80 dB (75 dB)

Adjacent Channel Selectivity FTZ, MPT
CQM713: 90 dB (80 dB)
CQM714: 85 dB (75 dB)

Intermodulation attenuation EIA
CQM713: 80 dB (75 dB)
CQM714: 78 dB (75 dB)

Intermodulation attenuation FTZ, MTP
CQM713: 75 dB (70 dB)
CQM714: 78 dB (75 dB)

Blocking MPT
190 mV (100 mV)

Spurious Radiation
Less than 0.5 n W (2 n W)

Spurious Response Attenuation
90 dB (80 dB)

AF Output Power EIA
2 W (load 5 Ω)

AF Distortion
CQM713: 3% (7%)
CQM714: 4% (7%)

AF Response
CQM713: −6 dB/octave from 300-3000 Hz
+0/−1.5 dB (+0.5/−3 dB)
CQM714: −6 dB/octave from 300-2500 Hz
+0/−1.5 dB (+0.5 dB/−3 dB)

Hum and Noise, squelched
80 dB (60 dB)

Hum and Noise, unsquelched
CQM713: 50 dB (45 dB)
CQM714: 45 dB (40 dB)

POWER SUPPLY SPECIFICATIONS

CURRENT CONSUMPTION AT 13.6 V

Stand by: 160 mA (190 mA)
Transmit: 2.7 A (3.1 A)
Receive AF output 2W: 470 mA (540 mA)

Storno

CQM710 GENERAL DESCRIPTION

Introduction

The Stornophone CQM710 radiotelephone is a mobile transmitter/receiver for simplex operated FM radio communication on the 146 to 174 MHz frequency band.

The CQM710 comes in a choice of channel spacings:

CQM713 for 20 or 25 kHz channel spacing
CQM714 for 12.5 kHz channel spacing

For both versions there is a choice of 6, 10 or 25 W RF output power.

There are also two mechanically different systems available, local control and extended local control. Local control applies to the dashboard-mounted model with built-in loudspeaker, which is operated by controls on the front panel of the radio cabinet. Extended local control applies to the model which is operated from a dash-mounted control unit connecting to the radiotelephone proper via a cable and multiconnector. The radio chassis is then placed elsewhere in the vehicle. A separate loudspeaker must also be installed with the latter model.

Each radio set can be equipped for either single or multichannel service. Multichannel sets will have a channel selector arranged as a row of push buttons on the control panel, accommodating up to 6 channels. Choice of channels (frequencies) must naturally take into account the RF bandwidth of the radiotelephone, which is 1 MHz.

Construction

The radio chassis slides into the cabinet from the front and is held in place by four screws from the rear of the cabinet. The chassis consists of two circuit panels hinged onto the front control panel. When separated, the two chassis halves open out like a book.

The upper circuit panel, designated RF711, contains all the circuits which are dependent upon channel frequencies. These are:

antenna filters
receiver VHF circuits
crystal selector unit, where included
exciter
transmitter power output amplifier

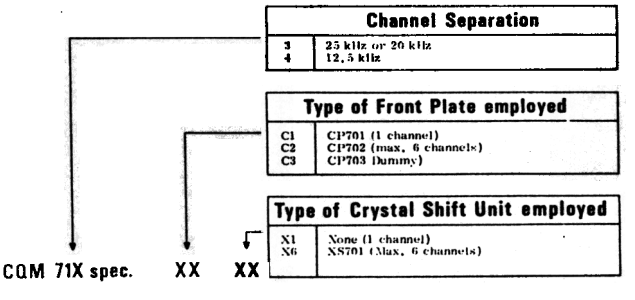
The lower circuit panel, designated BA701, contains those units common to all the frequency bands within the CQM710 programme:

audio amplifier
intermediate frequency amplifier
squelch circuit
voltage regulators
tone equipment, where included

The solid-state circuitry is built up as functional module units for ease in servicing.

A type plate located on the radio cabinet states the type designation of the radiotelephone, showing the service for which it is intended.

Reading the type plate:



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Control Equipment

The locally controlled CQM710 will have one of the following front panels:

CP701 Front panel with controls and built-in speaker. This panel has no channel selector, limiting the equipment to single-channel service.

CP702 Front panel like CP701 with the addition of 6 push buttons for multichannel service.

The CQM710 for extended local control will have a blank front panel with neither controls nor loudspeaker and is designated CP703. One of the following types of control units, intended for dashboard-mounting, must also be installed for extended local control:

CB701 Control unit housed in a cast plastic cabinet and containing operating controls for the radiotelephone. This control unit has no channel selector (single-channel service).

CB702 Control unit similar to CB701, and containing 6 push buttons for the channel selector (multichannel service).

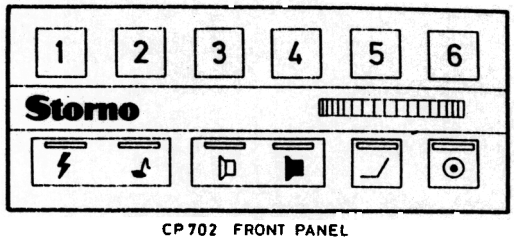
Where more than one RF channel is required (multichannel operation), the radiotelephone must be fitted with one of the following crystal switching units:

XS701 Channel selector unit for a maximum of 6 channels.

XS702 Channel selector unit for a maximum of 4 channels with temperature compensation for operation in extremely cold climates.

Operating Controls

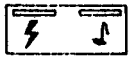
The controls located on the front panel are as shown:



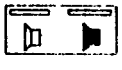
CP 702 FRONT PANEL

Push buttons for channel selection.

Tone button and lamp indication when the channel is engaged (in equipment with built-in tone transmitters).



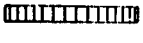
Transmit button and transmit indicator lamp (in radiotelephones without built-in tone transmitters).



Button for switching the loudspeaker on and off, provided with a lamp indicating when a tone call is received. (This button is only used in conjunction with tone equipment).

Squelch button for overriding the squelch function.

ON/off switch and indicator lamp.



Volume control

Notice:
For radiotelephones with built-in tone transmitters an external keying device (e.g. a steering column switch or microphone button) must be employed as the transmitter key, since the regular button on the front panel is used for keying the tone transmitter.

Accessories

Accessories available for the CQM710 series radiotelephones are listed in this section. Some of them, such as installation materials, antenna and microphone, are necessary in order to install and to operate the equipment.

Microphones

MC701 Fixed microphone with built-in amplifier

MC702 Fist microphone with built-in amplifier, transmit button and retainer.

MC703 Fixed microphone for mounting on steering column.

MT701 Handset with built-in amplifier and transmitter keying switch.

All of the above are supplied with cables terminated in solderless crimp pins for insertion in a special multiconnector providing connections between accessories and the radio cabinet.

MK704 To bring the microphone into close talk position this mounting kit, consisting of 2 flexible metal tubes (length 20 and 35 cm), is available.

Antenna

AN19-5 1/4 wavelength whip antenna for the 146 to 174 MHz frequency band. 50 ohm impedance matches Stornophone CQM710. Base design permits mounting from the outside without damaging the car upholstery.

Installation Kits

The installation of a CQM710 radio set will require some or all of the following installation kits:

MN701 Mounting frame for radio cabinet

CC701 Cable kit containing battery cable and antenna cable necessary for installing the radiotelephone.

MK701 Mounting kit containing connectors for connecting battery, antenna and accessories to the radio cabinet plus fuse box and fuses for installation in series with the battery cables.

MK702 Mounting kit similar to MK701, to be used when installing 25 W transmitters.

For extended local control the distance between control unit and radio set may be increased by inserting:

CC703 Extension cable kit with connectors.

Loudspeakers

When using the extended local control system it is necessary to install an external loudspeaker. The following types are available:

LS701 Loudspeaker enclosed in a plastic housing, complete with cable terminated in solderless crimp pins to be inserted in the accessories connector.

LS702 Weatherproof version of loudspeaker.

External Switches, Relays, etc.

SU701 Transmitter keying device for mounting on steering column.

SU702 Transmitter keying device for dashboard mounting.

SU703 Auto relay for equipment with built-in tone receivers, connects to external alarm devices such as auto horn, etc.

Power Supplies

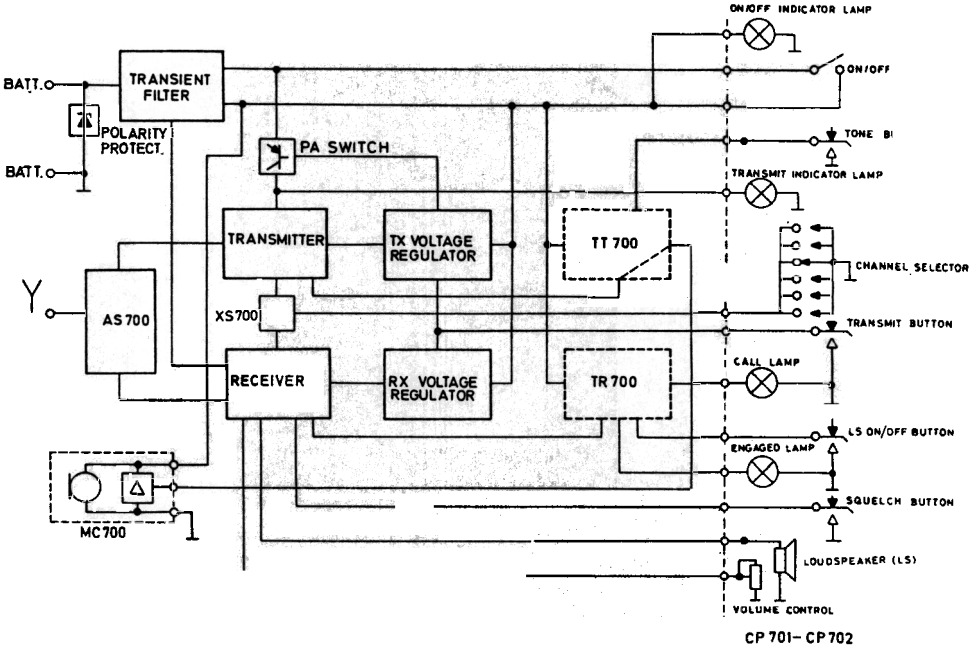
PS701 Power supply for 24 V car battery, any battery polarity.

PS702 Power supply for 24 V car battery, negative pole to chassis.

Storno

CIRCUIT DESCRIPTION

Functional Diagram



CP 701- CP 702

General

The nominal 12V supply from the battery is applied to the connector designated "BATT". A reverse biased zener diode across the battery input protects the radiotelephone against incorrect supply polarity. The supply voltage is fed, via a transient filter, to both the ON/OFF switch and to the transmitter power amplifier through a transistor switch.

The filtered battery voltage is applied to two 9V regulators which supply the transmitter and receiver sections, to the receiver audio output amplifier and to the tone equipment, if fitted.

The incoming signal passes through the antenna switching unit to the input of the receiver. The antenna switching is controlled by the stabilized supplies from the transmitter and receiver voltage regulators.

In the single channel edition of CQM710 a crystal controlled oscillator is incorporated in the transmitter section. Similary, a single oscillator is provided in the receiver section.

Channel switching unit XS is fitted in the multichannel edition of CQM700 and is controlled by the channel selector.

The audio output from the receiver is applied to the loudspeaker (LS). The output level is adjusted by means of the volume control.

The squelch button is provided to override the squelch function of the receiver.

As may be seen from the simplified functional diagram, the receiver output signal may be connected to the tone receiver TR700 used in selective tone calling systems. The tone receiver enables the AF output circuits of the receiver to be switched on and off.

In systems using selective calling, the loudspeaker will normally be switched off using the LS ON/OFF button.

Storno

When a tone call, correct for the tone receiver setting, is received, the loudspeaker will be switched on automatically. The tone receiver also controls the "call" and "engaged" lamps indicating that a call has been received or that the radio channel is occupied. These lamps are not used in radiotelephones not fitted with tone receivers.

The modulating signal to the transmitter is derived from the microphone (MC) via the tone generator TT700, if fitted.

During transmission of tone calls, the microphone will be switched off automatically so that the transmitter is modulated by the tone signal from TT700 only.

The transmitter is keyed by depressing the transmit button. This will block the receiver voltage regulator and cancel the blocking of the transmitter voltage regulator. When the transmitter voltage regulator operates, supply voltage is applied to the exciter and via a transistor switch to the transmitter power amplifier.

The "transmitter on" condition is indicated by the transmit indicator lamp.

In the radiotelephone fitted with a tone receiver, the transmitter cannot be operated until the loudspeaker has been switched on manually by means of the loudspeaker ON/OFF button.

RECEIVER

The CQM710 receiver is a double conversion superheterodyne using intermediate frequencies of 10.7 MHz and 455 kHz. The high RF sensitivity characteristic of the receiver is provided by a five element helix filter having a low insertion loss.

Adjacent channel selectivity is obtained by using two bandpass filters: a 10.7 MHz crystal filter and a 455 kHz ceramic filter.

A maximum of 6 crystal controlled oscillators, one for each channel, can be provided. The oscillators are connected in parallel and channel selection is performed by grounding the negative supply lead of the appropriate oscillator.

The receiver comprises the following subunits:

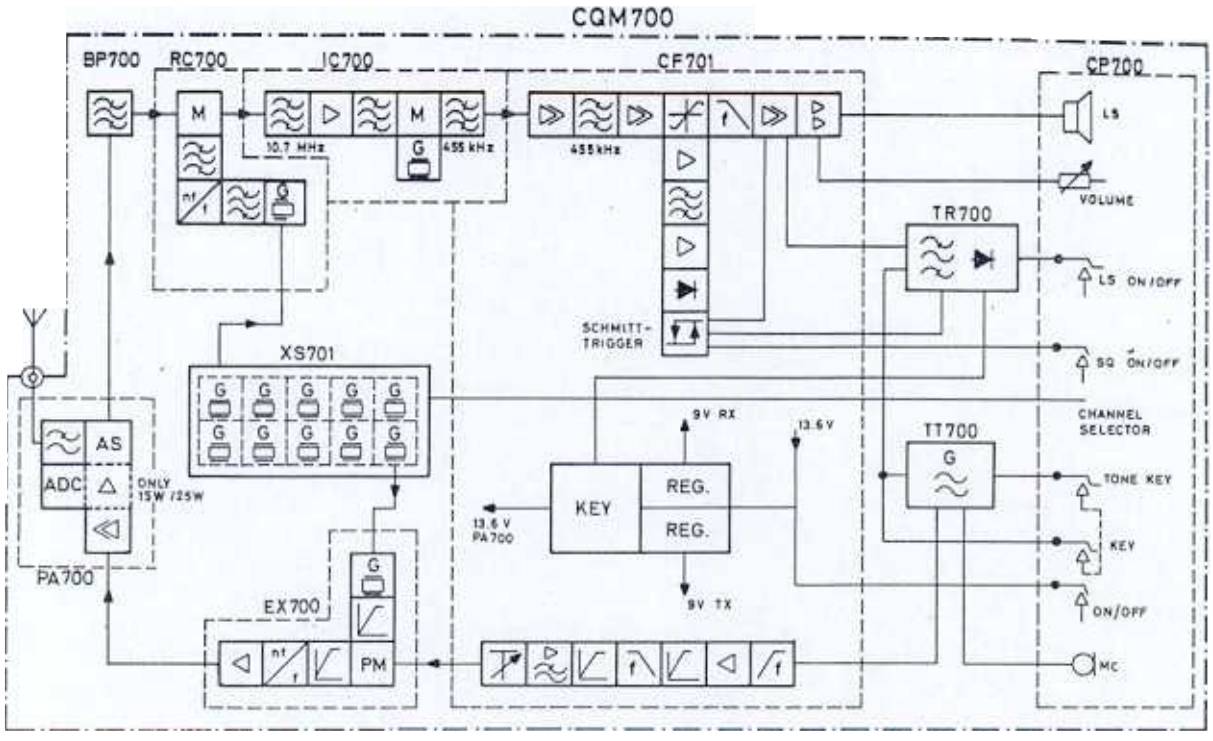
Antenna switching unit	AS711
Preselector filter	BP711
Receiver converter with 1st mixer and 1st local oscillator	RC711
Intermediate frequency converter with 10.7 MHz crystal filter, 2nd mixer, 2nd local oscillator and 455 kHz ceramic filter	
for 25 and 20 kHz channel spacing	IC703
for 12.5 kHz channel spacing	IC704
455 kHz intermediate frequency amplifier, squelch circuit, AF amplifier and voltage regulator	CF701
(for other circuits of CF701 see page 8)	
Channel switching unit:	
maximum 6 channels	XS701
maximum 4 channels, temperature compensated	XS702

Signal Path

From the antenna switching unit the input signal is passed through the preselector filter and an impedance matching network directly to the mixer stage. Because of the low insertion loss in the filter, it has been possible to obtain excellent receiver sensitivity without an RF amplifier stage. This approach has resulted in superior blocking, selectivity, and intermodulation characteristics of the receiver.

60.153-E2

Storno



The BP711 filter consists of five tuned circuits which can be adjusted over the band 146-174 MHz. The coupling between the filter and the mixer stage is provided by an impedance matching network loaded to a low Q. This network tranforms the output impedance of the filter to the impedance required by the field-effect transistor (FET) of the mixer stage.

The local oscillator and the received signals are applied to the gate of the FET. The mixer output at 10.7 MHz is taken from the drain circuit.

First Local Oscillator

The local oscillator signal is generated in an oscillator operating on the fundamental frequency of the crystal. The oscillator operates within the frequency range 11.35 MHz to 12.75 MHz, depending on the crystal frequency used.

In the oscillator, the 3rd harmonic of the crystal frequency is selected and applied to a multiplier chain consisting of two doubler stages. The output frequency is thus 12 time the fundamental frequency of the oscillator.

The last doubler stage is followed by a filter consisting of three capacitively coupled tuned circuits. The filter attenuates undesired frequencies generated by the multiplier chain and prevents these from reaching the mixer stage.

The injection signal is 10.7 MHz below the received signal and is calculated as follows:

$$fx = \frac{f_a - 10.7}{12} \text{ MHz}$$

where fx is the crystal frequency, MHz and f_a is the received signal, MHz.

The receiver converter RC711 includes an oscillator intended for use in single-channel receivers. When more than one channel is required the radiotelephone will be provided with a channel switching unit type XS701 or XS702.

XS701 contains oscillators for five RF channels thus allowing the receiver to be equipped with a maximum of 6 channels.

Storno

XS702 is a temperature compensating unit employed where radiotelephones are to work in very low temperatures. The compensation is provided by heating the crystals when the ambient temperature falls below -5°C approximately.

XS702 contains oscillators for a maximum of 4 channels.

Intermediate Frequency Circuits

From the mixer in RC711 the 10.7 MHz signal passes to the intermediate frequency converter, type IC703 or IC704 depending on the channel separation used, which provides the channel selectivity of the receiver.

The first IF signal passes through the 10.7 MHz crystal filter and is then amplified in a single IF amplifier stage. It is then applied to the transistor in the 2nd mixer stage and converted to the second IF signal of 455 kHz.

The injection signal to the mixer stage is generated by a crystal controlled oscillator whose frequency is normally 455 kHz below 10.7 MHz. In instances where a harmonic of the local oscillator coincides with the frequency of the received signal, a crystal oscillator frequency of 455 kHz above 10.7 MHz is chosen.

In the first case the crystal frequency is
10.7 MHz - 0.455 MHz = 10.245 MHz

In the second case the crystal frequency is
10.7 MHz + 0.455 MHz = 11.155 MHz.

The crystal frequency of 11.155 MHz is used when the received frequencies are within the following bands:

152.5 - 154.9 MHz
162.7 - 165.1 MHz
173.0 - 174.9 MHz

The second intermediate frequency signal from the mixer stage proceeds through the 455 kHz ceramic filter in the IC703 or IC704 converter and is then applied to the intermediate frequency amplifier in CF701.

The 455 kHz intermediate frequency amplifier consists of two RC coupled stages followed by a double tuned filter and a three stage integrated circuit amplifier. The last two stages provide the required limiting of the signal.

The amplified and limited signal is then demodulated in a phase detector incorporated in the integrated circuit.

The balanced quadrature (or product) detector also provides efficient rejection of any amplitude modulated signals that may be present.

The detector has only one tuned circuit and is simple to adjust.

AF Circuits

The demodulated signal is fed through a deemphasis network to a potentiometer, preset to suit the AF signal level obtained from the detector. This level depends on the maximum frequency deviation in use as determined by the channel spacing of the receiver.

The signal is then applied to a three stage amplifier in which a field-effect transistor, operating as an electronic on/off switch, has been placed between the second and third stages. This switch is controlled by the squelch circuit. The amplifier has a nominal output level of -17 dBm (110 mV).

The signal is passed to the loudspeaker amplifier and to the tone receiver, if fitted.

The loudspeaker amplifier amplifies the AF input signal of 110 mV to an output level of 2W into a 5 Ω load. The input stage is a high-pass active filter which attenuates frequencies below 250 Hz.

60.153-E2

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A variable resistor, forming part of the collector load, permits a preset 12 dB adjustment of the gain.

Manual gain adjustment, and thus the loudspeaker output level, is effected by the volume control on the control panel of the radiotelephone. Electrically, the volume control is connected between the first and second AF amplifier stages.

The AF output stage consists of two complementary power transistors operating in Class AB push-pull.

Temperature conpensation and negative feedback are employed in the output amplifier to improve stabilization.

By applying a positive voltage to a "muting terminal" on the output amplifier it is possible to mute the AF output to the loudspeaker. This muting occurs during periods of transmission and when controlled by tone equipment, if fitted.

Squelch Circuit

The squelch circuit in CQM700 is operated by noise components contained in the demodulated signal.

The AF signal from the discriminator is passed to a frequency selective amplifier with a resonant circuit as the collector load. The resonant frequency of this circuit can be changed by a strapping arrangement to suit the channel separation of the receiver.

The noise signal is passed through an amplitude selective noise amplifier, rectified and applied to a Schmitt trigger, which controls the electronic switch in the AF circuit.

When the noise level exceeds a certain value, i.e. when the signal to noise ratio falls below a certain value, the trigger circuit is activated and the AF output signal is switched off.

The Schmitt trigger also controls a squelch signal circuit which, in conjunction with a tone receiver, will operate the "engaged" lamp when there is traffic on the channel.

The squelch sensitivity is adjusted by a potentiometer located at the input of the noise amplifier.

The Schmitt trigger can be blocked manually by means of the squelch button on the control panel of the radiotelephone, thus overriding the squelch circuit.

TRANSMITTER

(See block diagram on page 6

The transmitter is phase modulated. Its output frequency is 12 times the oscillator frequency. Phase modulation is performed at the fundamental frequency.

The transmitter comprises the following subunits:

Exciter	EX711
RF power amplifier	PA711
Antenna switching unit	AS711
Modulation amplifier, transmitter switch and voltage regulator	CF701
(These circuits constitute part of CF701)	

Channel switching unit:

Maximum 6 channels	XS701
Maximum 4 channels, temperature compensated	XS702

AF Circuits

The modulating signal from the mircophone is fed, through the tone generator if fitted, to the modulation amplifier where it is differentiated, amplified, limited, integrated and filtered. The modulation amplifier transforms the microphone output to a signal suitable for the phase modulator and limits

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the signal amplitude so that the maximum permissible frequency deviation is not exceeded.

The modulation amplifier is designed around an integrated circuit containing two operational amplifiers. Differentiation is performed by an RC network at the input of the first amplifier. A high degree of negative feedback ensures constant gain of the amplifier which also operates as an amplitude limiter.

The output signal is then applied through an RC network to a second limiter consisting of two dual diodes.

This limiter has been provided to prevent the phase modulator from being overdriven at low modulating frequencies. For normal frequencies and deviations the limiter will be inoperative.

Before being applied to the phase modulator, the modulating signal is filtered in a splatter filter which has been designed as an active element using the second amplifier of the integrated circuit.

A potentiometer located at the output of the modulation amplifier is used to adjust the maximum frequency deviation.

RF Circuits

The fundamental RF signal is generated in a crystal controlled oscillator contained in the exciter EX711.

When more than one channel is required the radiotelephone will be provided with a channel switching unit type XS701 or XS702.

As in the receiver, channel selection is performed by grounding the negative return of the appropriate oscillator.

The exciter provides the following:

(a) phase modulation
(b) frequency multiplication
(c) drive power for the power amplifier PA711.

The RF signal from the oscillator is applied to the 1st buffer amplifier, then to the phase modulator, followed by the 2nd buffer amplifier. The buffer amplifiers provide constant input levels and correct impedance matching.

The phase modulator is a "transconductance modulator" as the phase modulation is produced by varying the transconductance of a transistor.

The modulating signal is applied to the emitter of the transistor whose operating point and transconductance thus change instantaneously with the modulating signal.

From the 2nd buffer amplifier, the signal is fed to a frequency multiplier chain consisting of a tripler, 1st doubler and 2nd doubler. The transmitter output frequency is therefore 12 times the crystal frequency.

The three multipliers are designed as balanced circuits resulting in suppression of some of the harmonic frequencies.

The tripler suppresses the even harmonics and the doublers suppress the odd harmonics.

Double tuned bandpass filters are used with close-to-critical coupling between tuned circuits. These filters limit the bandwidth of the exciter and attenuate undesired harmonics generated in the frequency multiplication process.

The output signal from the 2nd doubler is fed to an amplifier operating at the final frequency of the transmitter. Tuned input and output bandpass filters of the amplifier provide ad-

Storno

ditional selectivity and thus also attenuation of undesired signals. The amplifier raises the signal to the level required by the RF power amplifier PA711. The nominal RF output power of EX711 is 50 mW into a 50 Ω load.

The bandwidth of the transmitter and thus the maximum frequency spread of the channels is determined by the selectivity of the exciter, which is 1 MHz.

RF Power Amplifier

The power amplifier contains three transistor amplifier stages. The coupling between the stages consists of tuned matching networks with low loaded Q values.

The RF power amplifier is a high efficiency Class C amplifier. An ADC (Automatic Drive Control) circuit in the power amplifier unit regulates the supply voltage to the first stage and consequently the drive to the following stages. The purpose of the ADC circuit is to prevent overloading the power transistor. Additionally, the ADC circuit reduces the dependence of the output of the RF power amplifier on supply voltage and ambient temperature.

In the 25 W version, a power booster and a temperature protection circuit are also included in the PA stage.

The transmitter output power is adjusted to the required safe level by means of a potentiometer provided in the ADC circuit.

Antenna Circuits

The signal generated by the transmitter is passed through an electronic antenna switching unit and a low-pass filter to the antenna.

The antenna switching unit consists of diodes which are forward biased during transmission and reverse biased during reception. The low-pass antenna filter is a 7-pole Chebishev filter having low insertion loss and ripple.

The filter attenuates signals at undesired frequencies to an acceptable low level, e.g. harmonics of the transmitter frequency.

The antenna filter is not adjustable.

Power Supply and Switching Circuits

CQM700 is powered directly from a 12 volt car battery. The negative battery terminal connects directly to the cabinet of the radiotelephone.

A transient filter is provided to suppress noise and transients generated by the vehicle's electrical system.

A reverse biased zener diode connected across the battery input terminals limits the peak voltage to approx. 20 volts and protects the radiotelephone against damage caused by incorrect supply polarity. Incorrect battery connection will cause the diode to conduct and blow the fuses fitted in the battery cable.

The CQM700 contains two identical voltage regulator circuits which deliver 9V stabilized supply voltages for operating the transmitter and receiver sections of the radiotelephone. The supply to the loudspeaker output amplifier and the transmitter RF power amplifier is taken from the battery and is unstabilized.

The voltage regulators are protected at the output against short circuit by limiting the maximum current to a safe value.

Each regulator has a blocking transistor controlled by the transmit key button. With the CQM710 in the standby or receive condition, the key button is in the "off" position, i.e. not depressed. The receiver voltage regulator operates normally and operation of the transmitter voltage regulator is blocked. When the key button is pressed, operation and blocking of the two voltage regulators

Storno

are reversed. The supply voltage for the PA711 power amplifier in the transmitter is taken from the transient filter and applied to the amplifier unit through a transistor switch. This switch is supplied by the transmitter voltage regulator which is controlled by the transmit key button.

NOTE: The voltage applied to the transistor switch cannot be turned off by means of the ON/OFF switch of the radiotelephone.

Storno

ADJUSTMENT PROCEDURE FOR CQM710

RECEIVER ALIGNMENT

Before switching on the CQM700 connect a power supply with the correct polarity to the battery connector.

Set the supply voltage to 13.6 V and the current limiter to 100 mA.

With the station switched off, increase the supply voltage until a current drain of 100 mA is reached.

Requirement: $V_{supply} \leq 21$ V

Keeping within these values ensures correct operation of the protective zener diode, E13, in CF701.

Decrease the supply voltage to 13.6 V and set the current limiter to 1 A.

The station may now be switched on.

Check the 9 V RX at terminal 33 on the terminal board.

Requirement: 9 V ± 0.1 V

If necessary, adjust the RX voltage by means of potentiometer R64 in CF701. This potentiometer can be reached from the rear of the module tray BA700.

Alignment of 2nd IF Amplifier (455 kHz)

To protect the IF amplifier input stages, establish a good earth connection between a 455 kHz generator and the CQM700 chassis.

Apply a 455 kHz signal to the input of CF701. The IF generator STORNO G21 is well suited.

Connect a DC voltmeter with RF probe, STORNO 95.089 , to test point [1] in CF701.

Adjust transformers T1 and T2 for maximum meter reading, attenuating the generator output before overloading the IF amplifier, causing limiting. The readings should be kept below approx. 10 µA if an AVO-meter is used, and below approx. 500 mV if an EVM (electronic voltmeter) is used, and in any case below the point where an increase in generator output voltage results in a decreasing meter reading.

Coarse Adjustment of L1 in CF701

Disconnect the generator and disable the squelch by pushing the "Squelch out" button on the control panel/control box, or by switching the squelch off on the control unit C33/C34. Connect an AC EVM to terminal 35 LINE OUT (AF - 17 dBm) on the terminal board. On the control units C33/C34 the reading may be taken from LINE OUT.

Adjust coil L1 in CF701 for maximum meter reading. If two maxima are obtainable, adjust for the greater.

If no reading can be obtained, the potentiometer R16 (AF-RX) may be turned up. This potentiometer can be reached from the rear of the module tray BA700, and turns up counter-clockwise.

Adjustment of Oscillator Frequency in IC700

If a frequency counter is available, the frequency may be read at test point [5] , IC700. If the input of the frequency counter is DC-coupled, a capacitor (approx. 1 nF) should be connected in series. The frequency will either be 10.245 or 11.115 MHz. Refer to circuit description, "Intermediate Frequency Circuits".

Where no counter is at hand, proceed as follows:

Connect a 455 kHz generator to the IF input of CF701 and a 10.7 MHz generator to the input of IC700. A modified G21 may be used, i.e. the two oscillators, 455 kHz and 10.7 MHz, both in operation at the same time by pressing both buttons. The 10.7 MHz output is fixed, and the 455 kHz variable by means of the attenuator. The accuracy of the generator signal should be checked to be 10.7 MHz ± 20 Hz.

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Adjust the output level of the 455 kHz generator until a beat note is produced in the speaker (LS in/out must be pressed if tone equipment is installed).

Adjust trimmer capacitor C12 in IC700 for zero beat.

The frequency difference may also be observed on an oscilloscope connected to the "Line out", 600 ohm audio output, which is accessible on the terminal board, terminal 35, and on the control units C33/C34.

NOTE: The discriminator has no zero adjustment.

Alignment of 1st IF Amplifier (10.7 MHz)

Apply a 10.7 MHz signal to the input of IC700.

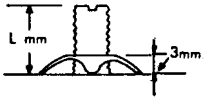
Connect a DC meter with an RF probe (95.089) to test point [1] in CF701.

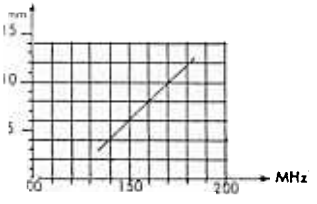
Adjust coils L1, L2 and L3 in IC700 for maximum meter reading. The input level should be kept low enough to prevent limiting.

Gain of IC700: $\geq$ 20 dB

Coarse Adjustment of BP711

The trimming slugs, L1, L2, L3 and L4 of the filter BP711 are to be set to the approximate positions according to the graph. The graph and the picture indicate the mechanical position of the slugs as a function of the receiver antenna frequency. L5 is to remain in its outermost position.





Alignment of Multiplier Chain in RC711

When crystals have been inserted in RC711 and/or XS701/XS702, select the middle frequency channel.

Connect a DC voltmeter to test point (1) in RC711.

Tune L7 and L8 in RC to maximum, approx. 0.4 V.

Requirement: $\geq$ 0.3 V.

Connect a DC voltmeter to (2).
Tune L6 for minimum, approx. 8V.
Requirement: $\leq$ 8.5V

To tune for maximum drive to the 1st mixer, connect a DC voltmeter with an RF probe to test point (2) in RC711.

L5, RC711, is adjusted for maximum meter reading.

L4, RC711, is adjusted for minimum meter reading.

L3, RC711, is adjusted for maximum meter reading.

L1, RC711, is adjusted for minimum meter reading.

Since only very small variations occur at test point (2), especially in the final circuits, the drive to the 1st mixer should be checked:

Connect a DC voltmeter to test point (3) in RC711.

Touch up the tuning of coils L5, L4, L3, and L1 for maximum meter reading.

Stop the oscillator (select a channel with no crystals or take a crystal out).

The voltage at test point (3) with the oscillator stopped will be 1 to 4.5 V.

Start the oscillator.

Requirement: Minimum increase at test point (3), RC711 = 0.5 V.

Adjustment of Temperature Regulating Circuit in XS702

The temperature regulating circuit of XS702 has been adjusted before leaving the factory. However, if necessary, it may be readjusted as follows:

Turn potentiometer R39 in XS702 fully counter-clockwise.

Remove jumper connecting the NTC resistor.

Set the supply voltage for the CQM700 to 13.6 V.

Check the current consumption of XS702 by inserting an ammeter in the orange/blue wire to XS702.

Storno

Adjust the current to 0.45 A by means of R39 (This adjustment should not exceed 30 seconds).

Insert jumper connecting the NTC resistor again and reconnect the orange/blue wire.

Further Alignment of RC711, Fine Tuning of BP711, and Fine Tuning of IC700

Connect a DC EVM with an RF probe to test point [1] in CF701. An AVO-meter may be used, but the deflection will only be on the order of tens of microamperes.

Connect an unmodulated RF generator to the antenna input of the CQM700.

Set the generator to the receiver frequency. Fine tuning of the generator frequency may be done by loosely coupling a 455 kHz signal to the IF input of CF701. (First connect CQM700 chassis to generator earth.) Tune the RF generator for zero beat with the LS in/out depressed if tone equipment is installed.

The RF generator output should be kept low enough to prevent limiting in CF701, i.e. a reading of approx. 500 mV on a DC EVM with an RF probe at test point [1], CF701.

The following coils are tuned for maximum meter reading in this order:
L1, RC711
L5, BP711
L4, BP711
L3, BP711
L2, BP711
L1, BP711

Due to interaction, especially between L1 in RC, and L5 in BP, the procedure should be repeated until no further increase in meter reading can be obtained.

By adjusting L1, RC711, the oscillator drive signal to the first mixer will have decreased. L3, RC711, must be fine tuned for maximum reading on a DC voltmeter connected to test point (3), RC711.

Now, when stopping the oscillator, the voltage at test point (3) should fall at least 0.3 V.

L2 in RC, and L1, L2 and L3 in IC700, are now fine tuned for maximum reading at test point [1], CF701. The circuits in IC700 should be aligned two or three times, as they influence each other.

Fine Tuning of L1 in CF701

Keep the RF generator connected as described and set its output attenuator for full limiting in the CQM700, approx. 1 mV EMF from the generator.

Modulate the generator with 1 kHz to a frequency swing of ± 3.5 kHz, (for CQM734: ± 1.75 kHz).

Connect an audio voltmeter to test point [2] in CF701. This test point becomes accessible by unscrewing the upper PC-board of CF701.

Peak coil L1 in CF701, for maximum meter reading.

Requirement: $\geq$ 65 mV (for CQM714: $\geq$ 32 mV)

NOTE: Terminal 35 "Line out", on the terminal board or the connector "Line out" on the control units may be used instead of test point [2]. However, this reading is dependent on the setting of potentiometer R16, AF-RX, in CF701, and it must be checked that an audio level of $\geq$ 110 mV can be obtained from "Line out" for the appropriate frequency deviation as shown below.

Adjustment and Checking of Audio Circuits

Modulate the RF generator with 1 kHz, and set the frequency deviation to 0.7 x Δ f max.:

CQM713 (25 kHz channel spacing) 3.5 kHz
CQM713 (20 kHz channel spacing) 2.8 kHz
CQM714 (12.5 kHz channel spacing) 1.75 kHz

Set the RF generator output level to approx. 1 mV EMF.

If the CQM700 is provided with tone equipment press the LS in/out button.

Check the frequency of the RF generator.

Back off the volume control on the control unit,

Storno

and on the control box/control panel, if any.

Connect an audio voltmeter to "Line out".

Adjust the audio output level to 110 mV by means of R16 in CF701.

Connect a 5 Ω load resistor across the loudspeaker output terminals instead of the loudspeaker. The load is incorporated in the control units C33/C34.

Connect an audio voltmeter and a distortion meter across the loudspeaker terminals or to LS in/out on C33/C34. Set the volume control for 2.25 V on the meter.

Check the distortion.

Requirement: k $\leq$ 5%.

NOTE: Before leaving the factory, the audio output amplifier has been adjusted for:

- a power output of 2 W (by means of potentiometer R83 on CF701) for an audio input of 110 mV from LINE OUT (AF -17 dBm),
- a base bias to the output amplifier transistors ensuring a suitable no-signal current in the stage.

Consequent adjustment of the no-signal current in the output stage is performed in the following way:

Turn the station off, and the volume control down.

Turn potentiometer R99 fully counter-clockwise (viewed from the component side of CF701).

Set the supply voltage to 16 V.

Insert a milliammeter in the positive supply lead to the output amplifier (brown lead between the two PC-boards of CF701, terminals C/C of CF701).

Turn the station on. The reading will be approx. 15-25 mA.

Turn potentiometer R99 clockwise until the current drain has increased by 2 mA.

Checking the Audio Power Output

Set the volume control for 3.16 V across the audio output load (corresponding to a power output of 2 W) for an input signal of 1 kHz, 110 mV.

Connect the distortion meter across the output and read the distortion.

Requirement: k $\leq$ 7%.

Adjustment of Oscillator Frequency in RC711

The frequency is measured after the doubler with a counter connected to test point (2) in RC711. The frequency should be $f_{antenna} - 10.7$ MHz. The oscillator frequency is adjusted with C27, RC711.

In CQM700 with XS701/XS702 frequency adjustment must be performed on each channel with the trimmer capacitor of the appropriate oscillator.

Requirement:
CQM713: Better than $\pm 1 \times 10^{-6}$
CQM714: Better than $\pm 0.5 \times 10^{-6}$

The tolerances are valid only for a crystal temperature of 25° C.

Checking Receiver Sensitivity

Modulate the RF generator with 1 kHz, and a frequency deviation of 0.7 x max. Δ f.
Set the generator output to 1 mV EMF.

Connect the distortion meter across the loudspeaker terminals, substituting a 5 Ω resistor for the speaker.

Set the volume control for 1 V across the load.

Reduce the RF generator output until 12 dB SINAD is obtained on the distortion meter.

Read the calibrated RF voltage from the RF generator.

Requirement: for 12 dB SINAD $\leq$ 0.8 µV EMF.

If more than one channel is provided, the procedure should be repeated on all channels.

Adjustment and Check of Squelch

Adjust the squelch by means of potentiometer R38 in CF701 to open the audio signal path for an antenna signal of 10 to 12 dB SINAD across the speaker terminals.

Remove the antenna signal and check that the squelch will close and block the audio output.

Check that the audio path reopens when the squelch button is activated.

Checking Overall Current Consumption

Check the current drain at 13.6 V supply voltage.

Requirement:

CQM700 without tone equipment, in stand by, single channel = 200 mA (typically 170 mA)

CQM700 without tone equipment, in stand by, multichannel = 270 mA (typically 240 mA)

TRANSMITTER ADJUSTMENT

Unless the receiver alignment procedure has been performed, check for correct operation of the protection diode, E13, on CF701. This test is described in the first paragraphs under "Receiver Alignment".

Then set the supply voltage to 13.6 V, and the current limiter to 4 A.

If tone equipment is installed, the LS in/out button must be pressed to establish a DC path for the transmitter keying function.

With the transmitter output loaded (antenna or dummy load connected), key the transmitter and check 9 V TX at terminal 19 on the terminal board.

NOTE: If 9 V RX was not present or was set too low before keying the transmitter, the 9 V TX series regulator will not start.

Requirement: 9 V TX = 9 V ± 0.1 V.

If necessary, adjust the TX voltage by means of potentiometer R72 on CF701. This potentiometer can be reached from the rear of module tray BA701.

Alignment of Exciter EX711

Remove the RF signal lead between EX711 and PA711.

Connect a 47 Ω resistor across the output of EX711 (this load may also be soldered across the input of an RF probe, STORNO 95.059, and the probe connected across the output of EX711 for the duration of the alignment of the exciter).

When crystals have been inserted in EX711 and/or XS701/XS702, select the middle frequency channel and key the transmitter.

Connect a DC voltmeter to test point (1) in EX711.

Adjust L4 and L5 for maximum meter reading, approx. 1.4 V.

Move the voltmeter to test point (2) in EX711.

Adjust L7 and L6 for maximum meter reading, approx. 0.8 V.

Move the meter to test point (3), EX711.

Adjust L9 and L8 for maximum, approx. 0.05 V.

Adjust L10 for maximum output.

Adjust L6, L7, L8, L9, and L10 for maximum RF output from EX711.

Requirement: $P_{out} \geq 80$ mW.

(Measured with a DC voltmeter and RF probe 95.059, the voltage should read more than 4.5 V).

Alignment of RF Power Amplifier (PA711)

Reestablish the connection between EX711 and PA711.

Connect a Wattmeter to the antenna output.

PA711 should be aligned at a supply voltage of 13 V.

Turn the ADC potentiometer, R2, PA711 up (clockwise).

Set all trimmer capacitors for half capacity.

NOTE The PA711 should be aligned with its shielding lid in place, and insulated trimming tools should be used.

Install the lid and key the transmitter.

Remove shorting link designated "A" and insert a DC ammeter instead.

Adjust trimmer capacitor C7 for maximum reading on DC ammeter.

Remove shorting link designated "B" and insert the DC ammeter instead.

Adjust trimmer capacitor C11 for maximum reading on DC ammeter.

Remove shorting link designated "C" and insert the DC ammeter instead.

Adjust trimmer capacitor C16 for maximum reading on the DC ammeter.

If no current can be obtained increase the capacity of trimmer C22 and repeat the adjustment of C16.

Adjust trimmer capacitors C22 and C23 for maximum power output (repeat the adjustment a couple of times.)

Adjust trimmer capacitors C14 and C16 for maximum power output (repeat the adjustment a couple of times).

Repeat the alignment of C22, C23, C14 and C16.

Adjust trimmer capacitors C10 and C11 for maximum power output

Adjust trimmer capacitors C6 and C7 for maximum power output.

Make the final adjustments for for C6, C7, C10, C11, C14, C16, C22 and C23, in that order, for maximum power output.

Set the ADC potentiometer, R2 in PA711, for 12 watts power output with 13.6 V supply voltage from the power supply. This will ensure a power output of more than 10 W if the supply voltage is increased to 16 volts taking into account that the ADC circuit will reduce the power output with increasing supply voltage

Adjustment of Transmitter Frequency

The counter is connected to the transmitter output via a suitable (10 W capacity) attenuator. The antenna frequency is adjusted with C2 in EX711 and/or the trimmer capacitors in XS701/XS702. The frequency must be adjusted on all channels and at crystal temperatures of $25^{o}C$.

Requirement:
CQM713: Better than $\pm 1 \times 10^{-6}$
CQM714: Better than $\pm 0.5 \times 10^{-6}$

Automatic Drive Control (ADC) Circuit

When the ADC circuit is operating properly, the following figures must be obtainable on all channels:

At 10.5 V supply voltage:
Current Drain: 2.9 A ($\leq$3A)
Power Output: 6 W

At 13.6 V supply voltage:
Current Drain: 3.0 A ($\leq$3.1 A)
Power Output: 10 W

At 16.0 V supply voltage:
Current drain: 2.9 A ($\leq$3A)
Power Output: 13 W $\pm$ 1 W.

These values for total current drain apply to stations without tone equipment. The values in brackets apply to stations with XS701/XS702

The relationship between supply voltage, power output, and current consumption in the individual stages of PA711 is dependent on the antenna frequency. The current in individual stages may be read by substituting an ammeter for the shorting links, A, B and C, in the collector leads of transistors Q1, Q2 and Q3 in PA711.

Requirements:

At 10.5 V supply voltage,
Power output: $>$ 6 W
Current in "C": $<$ 1.0 A
Current in "B": $<$ 0.35 A
Current in "A": $<$ 80 mA

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At 13.6 V supply voltage,
Power input: =12 W
Current in "C": < 1.6 A
Current in "B": < 0.5 A
Current in "A": < 80 mA

At 16.0 V supply voltage,
Power current: ≥ 10 W
Current in "C": < 1.6 A
Current in "B": < 0.3 A
Current in "A": < 80 mA

Correct values here also indicates that the ADC circuit is operating satisfactorily.

Use of Control Unit C33/C34 When Adjusting Modulation

The control units C33/C34 may be used for stations with or without tone equipment and a voltage divider and a DC blocking capacitor is incorporated.

Where a tone transmitter is installed the modulation signal must pass through the switching transistor (the AFgate) in the tone transmitter. The emitter resistor for this transistor is situated in the microphone amplifier, which is disconnected when adjusting the modulation. An alternate DC path must therefore be provided for the switching transistor in the tone transmitter to allow it to pass the modulation to the modulation amplifier of the CQM700. The DC supply voltage for the microphone amplifier in MC700 is also obtained through the switching transistor. This DC voltage should be isolated from the audio generator output.

A resistor R3, in fig. 2 has been installed to provide the DC path for the switching transistor. This resistor would,as far as AC is concerned, seem to be in parallel with R112 in CF701. To the audio generator the two would present an impedance of 280 Ω which is only half the required value. Another resistor, consisting of R1 and R2 in C33/C34, places 280 Ω in series with the input signal, bringing the input impedance up to 560 Ω. At the same time, a capacitor in series with the signal effectively blocks the DC voltage from CF701, which is normally fed to the micro-

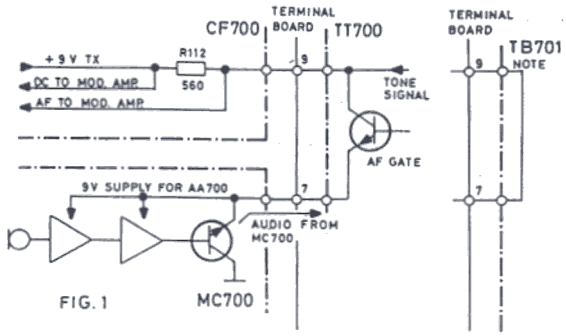


FIG. 1

MODULATION PATH FROM MC700 TO CF700, AND 9V SUPPLY FROM CF700 TO MC700.
NOTE: WITHOUT TONE TRANSMITTER TB701 MUST BE INSTALLED

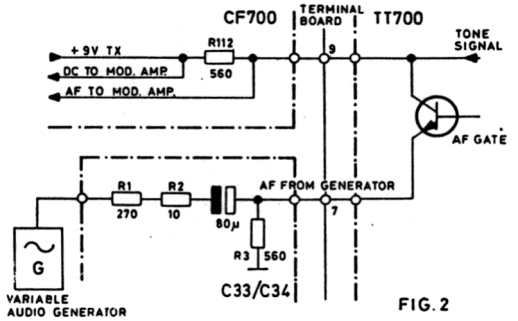


FIG. 2

MODULATION THROUGH USE OF CONTROL UNIT C33/C34 (SEE ALSO NOTE IN FIG.1)

phone amplifier in MC700 through terminal 7 of the terminal board.

The resistors combine as a voltage divider when seen from the input to the control unit marked "modulation, AF gen.". This voltage divider attenuates the audio generator output by 6 dB in passing through C33/C34 to the modulation amplifier on CF701. The generator output must therefore be set 6 dB above the required input to the amplifier modulation. The adjustment procedure takes this into account.

Adjustment of Modulation and Frequency Deviation

NOTE: Where an ST7845 is installed, TB701 must be substituted during the following procedure.

Connect the deviation meter to the transmitter output via an attenuation network (10 W capacity).

Connect a distortion meter and an audio voltmeter to the audio output of the deviation meter.

Set the power supply voltage to the CQM700 to 13.6 V.

Storno

Connect an audio generator to the modulation input of control unit C33 or C34.

Set the generator for an audio output of 2.2 V. This value is 20 dB above the nominal modulation input level to ensure full limiting in the modulation amplifier on CF701. The 6 dB loss in C33/C34 is also taken into account, and the nominal input level will be found to be 2.2 V −26 dB = 110 mV.

Find the audio generator frequency between 300 Hz and 3 kHz giving the greatest frequency deviation as read on the deviation meter with the transmitter keyed. At that audio frequency set the maximum deviation with R124 on CF701.

CQM713 (25 kHz) Δf max. = ± 5 kHz
CQM713 (20 kHz) Δf max. = ± 4 kHz
CQM714 (12.5 kHz) Δf max. = ± 2.5 kHz

Set the audio generator to 1000 Hz and attenuate the output until a frequency deviation of 0.7 x Δf max. is read on the deviation meter.

CQM713 (25 kHz) 0.7 x Δf max. = ± 3.5 kHz
CQM713 (20 kHz) 0.7 x Δf max. = ± 2.8 kHz
CQM714 (12.5 kHz) 0.7 x Δf max. = ± 1.75 kHz

Requirement: V_{mod} = 220 mV ± 2 dB (175 mV - 275 mV) input to C33/C34.

Check the distortion on the audio output of the deviation meter.

Requirement: k $\leq$ 7% (without de-emphasis)

Checking the Transmitter Stability

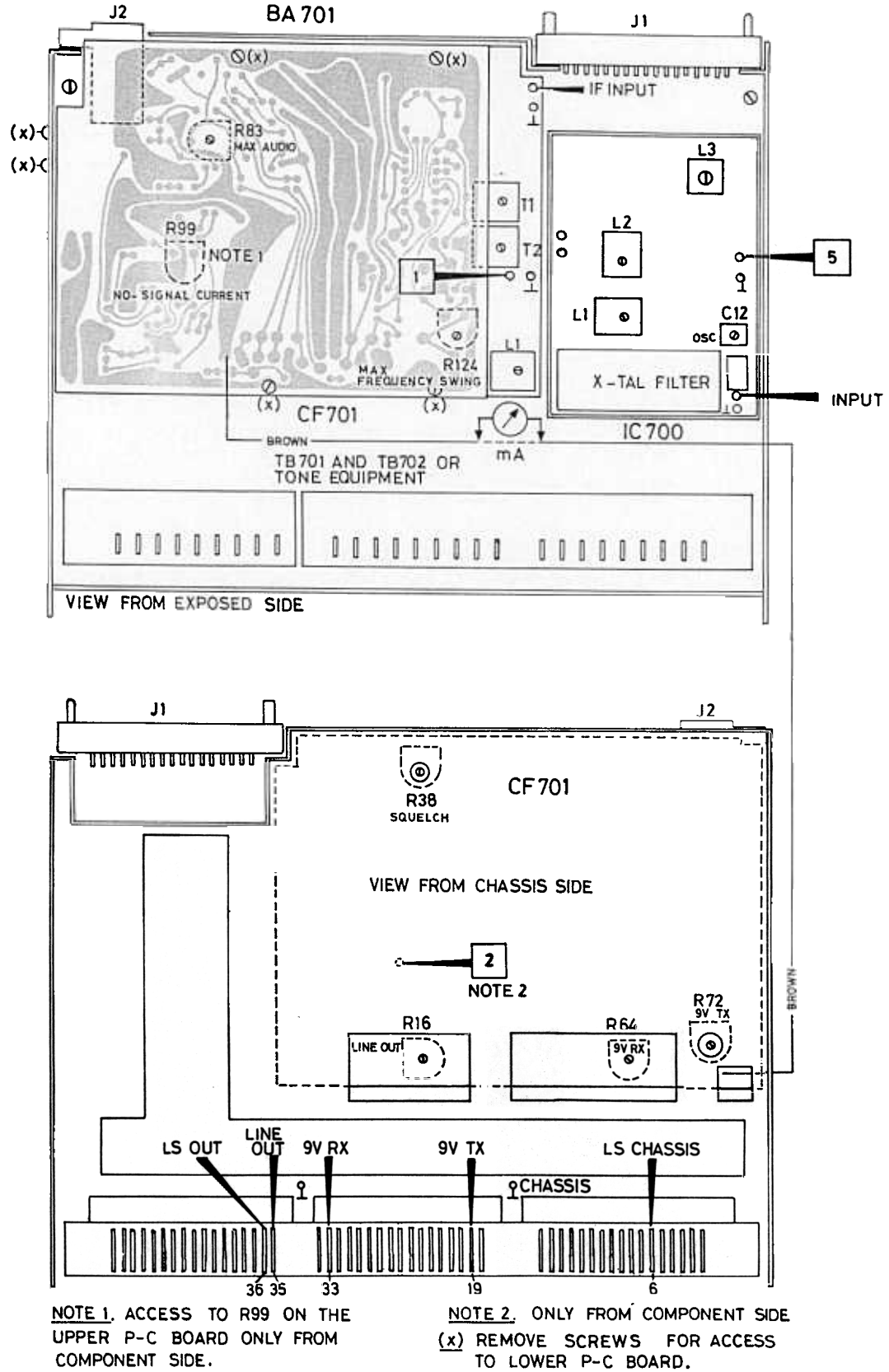
Transmitter instability appears as AM modulation of the transmitted carrier by a modulating frequency which may vary between 0.5 - 40 MHz.

The existence of parasitic oscillations can be determined by means of a detector followed by a filter, which removes the carrier, and an indicator, e.g. an oscilloscope, a millivoltmeter, or simply a multimeter with a diode detector. When using the latter, an amplifier is required, e.g. STORNO amplifier detector type TS-F42A.

While varying the phase angle with W52C, check that no deflection appears on the AM indicator at any supply voltage between 10.5 V and 16 V.

For further details please refer to STORNO Service News No. 38 of May, 1969.

Storno



NOTE 1. ACCESS TO R99 ON THE UPPER P-C BOARD ONLY FROM COMPONENT SIDE.

NOTE 2. ONLY FROM COMPONENT SIDE

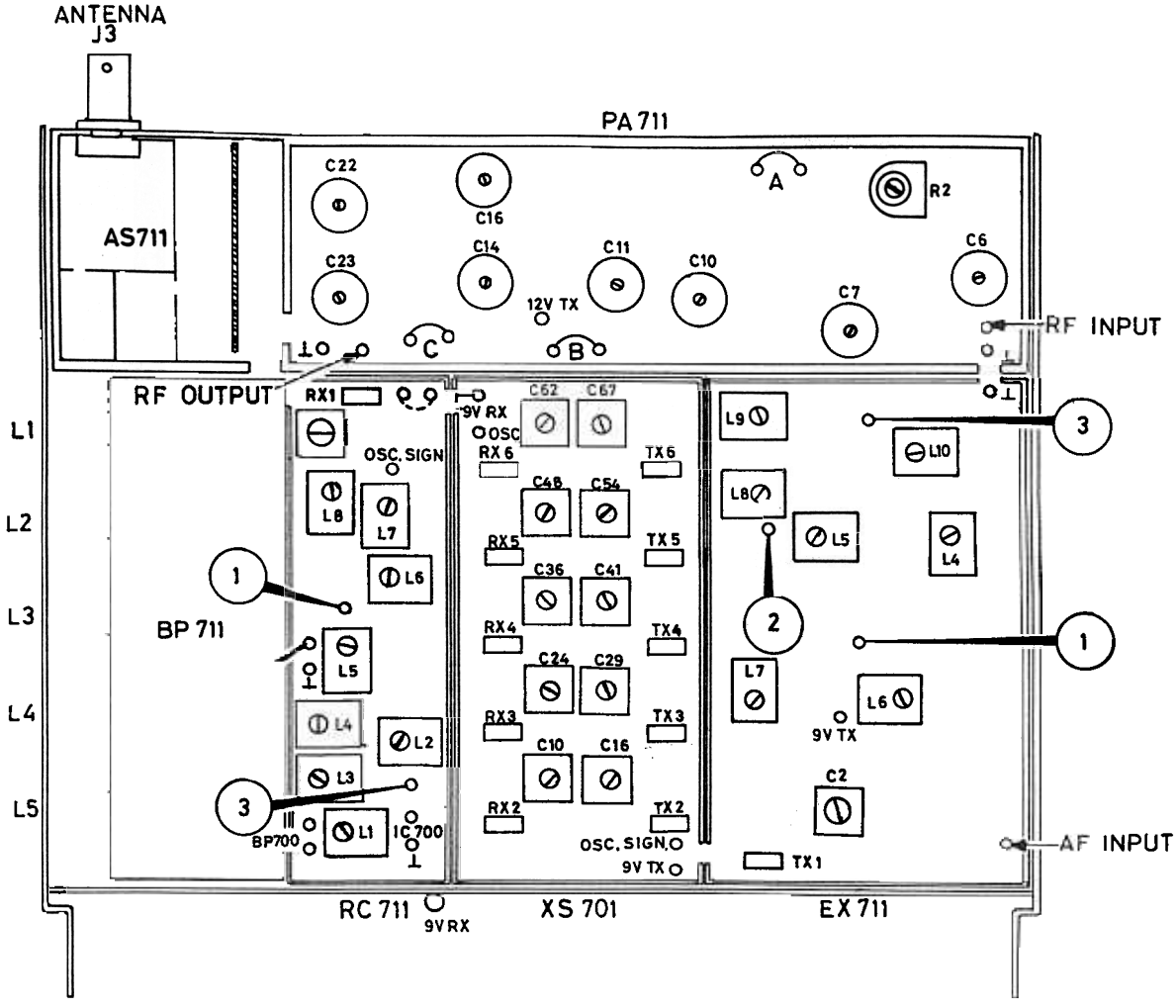
(x) REMOVE SCREWS FOR ACCESS TO LOWER P-C BOARD.

BASIC ASSEMBLY BA701 (CQM700)

Location of Test Points and Adjustable Components

D401.826

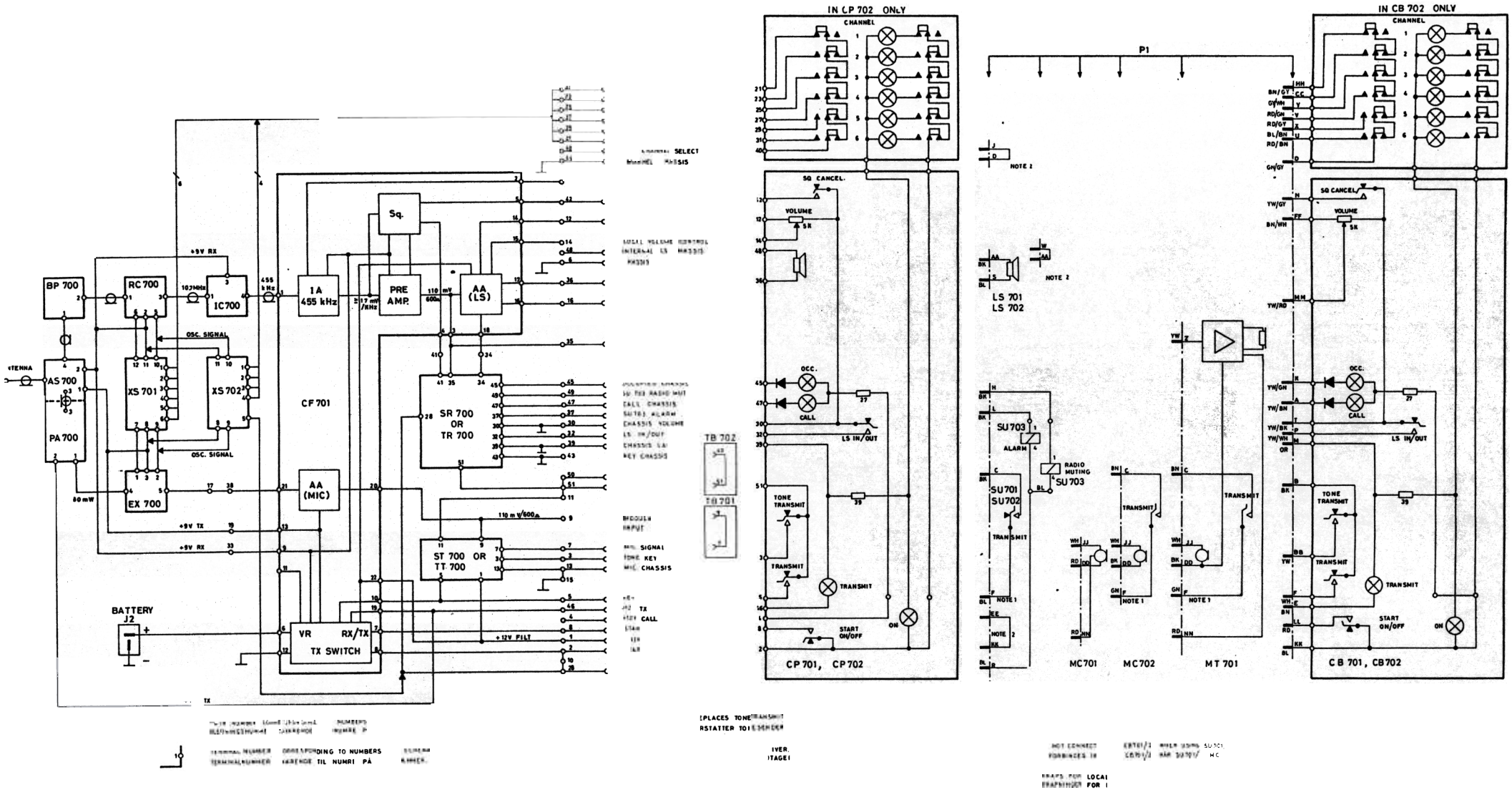
Storno



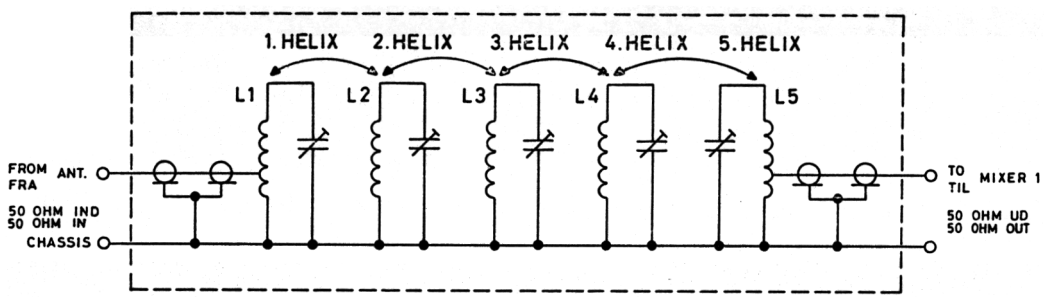
RADIO ASSEMBLY RF710 (CQM710)

Location of Test Points and Adjustable Components

D401.827


IN CP 702 ONLY
IN CB 702 ONLY
CHANNEL
P1
BP 700
RC 700
IC700
IA 455 kHz
PRE AMP.
Sq.
AA (LS)
AS 700
XS 701
XS 702
CF 701
PA 700
EX 700
AA (MIC)
SR 700 OR TR 700
ST 700 OR TT 700
VR
RX/TX
TX SWITCH
BATTERY
J2
+9V RX
+9V TX
OSC. SIGNAL
+12V FILT
SQ CANCEL.
VOLUME
5K
OCC.
CALL
LS IN/OUT
TONE TRANSMIT
TRANSMIT
START ON/OFF
ON
TB 702
TB 701
LS 701
LS 702
SU 703
ALARM
RADIO MUTING
SU 701
SU 702
NOTE 1
NOTE 2
CP 701, CP 702
MC 701
MC 702
MT 701
CB 701, CB 702

Storno



BAND PASS FILTER
BÅNDPASFILTER

BP711

D 401.383

Storno

TYPE	NO.	CODE	DATA
BP711		10.2554	Band Pass Filter
	L1	62.0819	RF coil
	L2	62.0819	RF coil
	L3	62.0819	RF coil
	L4	62.0819	RF coil
	L5	62.0819	RF coil

Storno

TYPE	NO.	CODE	DATA

BAND PASS FILTER
BÅNDPASFILTER

BP711

X401.381

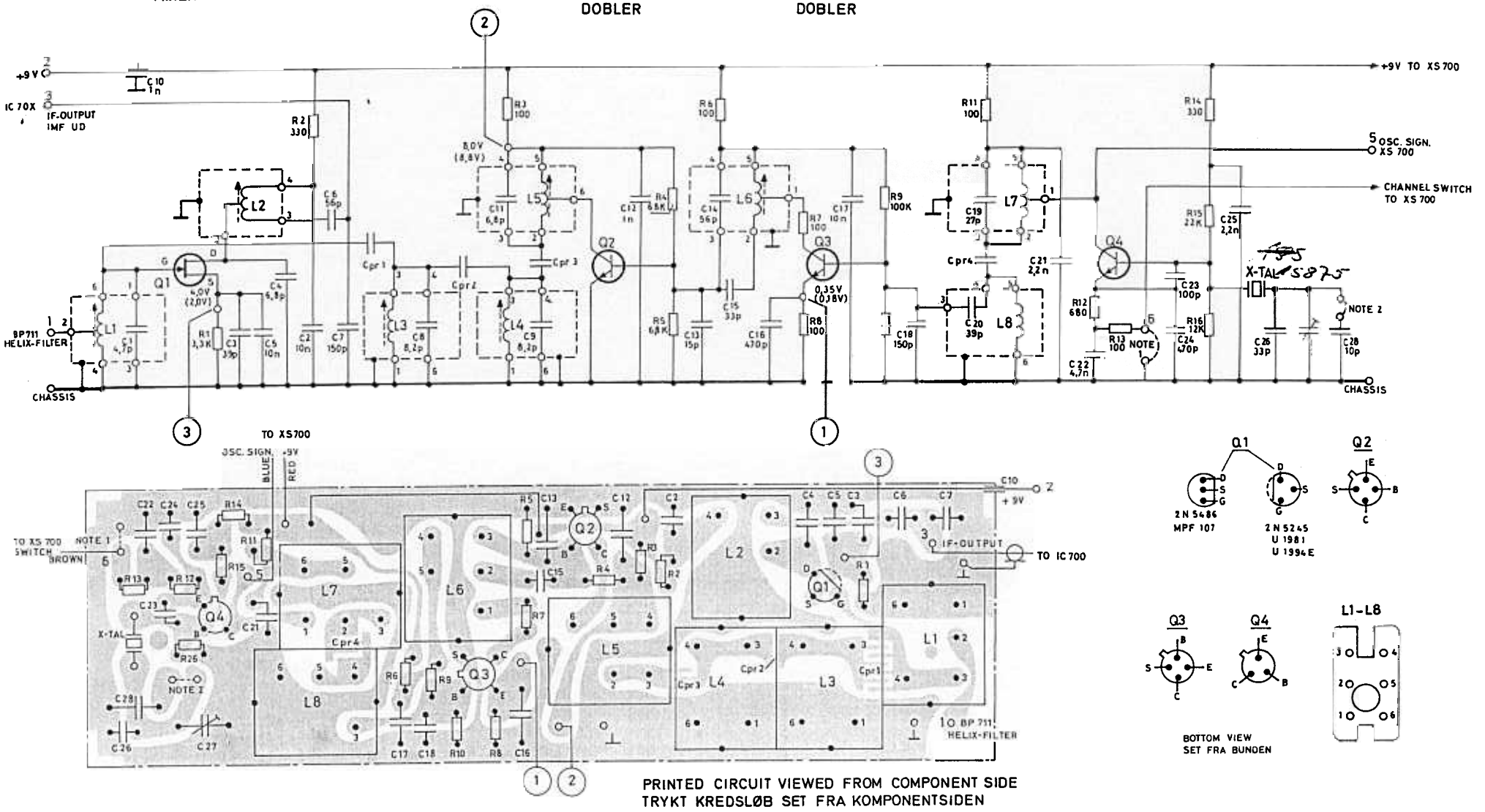
Storno **Storno**

MIXER

2. DOUBLER
DOBLER

1. DOUBLER
DOBLER

OSC./ TRIPLER



PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE
TRYKT KREDSLØB SET FRA KOMPONENTSIDEN

Cpr 1 - Cpr 4 ARE PRINTED CAPACITORS.

DC VOLTAGE WITHOUT BRACKETS ARE MEASURED WITH SIGNAL.
DC VOLTAGE WITH BRACKETS ARE MEASURED WITHOUT SIGNAL.

NOTE 1. STRAP FOR 1 CHANNEL.
NOTE 2. TO EXTEND THE LOWER RANGE OF FREQUENCY PULLING INSERT STRAP.

Cpr 1-4 ER I PRINTPLADEN.

DC SPÆNDINGER UDEN PARANTES ER MÅLT MED SIGNAL.
DC SPÆNDINGER MED PARANTES ER MÅLT UDEN SIGNAL.

NOTE 1 STRAPPES VED 1 KANAL.
NOTE 2 STRAPPES FOR STØRRE FREKVENSTRÆKNING NEDEFTER.

RECEIVER CONVERTER
MODTAGERKONVERTER

RC711

D401.342/2

TYPE	NO.	CODE	DATA		
RC711		10.2557	Receiver Converter		
	C1	74.5131	4.7 pF ± 0.25 pF	ceram DI	250 V
	C2	74.5109	10 nF -20 +80%	ceram PL	20 V
	C3	74.5117	39 pF 5%	ceram TB	160 V
	C4	74.5133	6.8 pF ± 0.25 pF	ceram DI	250 V
	C5	74.5109	10 nF -20 +80%	ceram PL	20 V
	C6	74.5111	56 pF 5%	ceram TB	160 V
	C7	76.5103	150 pF 2.5%	polystyr TB	25 V
	C8	74.5134	8.2 pF ± 0.25 pF	ceram DI	250 V
	C9	74.5134	8.2 pF ± 0.25 pF	ceram DI	250 V
	C10				
	C11	74.5133	6.8 pF ± 0.25 pF	ceram DI	250 V
	C12	74.5155	1 nF -20 +80%	ceram PL	63 V
	C13	74.5137	15 pF 5%	ceram DI	125 V
	C14	74.5111	56 pF 53	ceram TB	160 V
	C15	74.5116	33 pF 5%	ceram TB	160 V
	C16	74.5161	470 pF -20 +80%	ceram PL	63 V
	C17	74.5109	10 nF -20 +80%	ceram PL	20 V
	C18	76.5103	150 pF 2.5%	polystyr TB	25 V
	C19	74.5116	33 pF 5%	ceram TB	160 V
	C20	74.5116	33 pF 5%	ceram TB	160 V
	C21	76.5059	2.2 nF 10%	polyest FL	50 V
	C22	76.5061	4.7 nF 10%	polyest FL	50 V
	C23	76.5102	100 pF 2.5%	polystyr TB	25 V
	C24	76.5106	470 pF 2.5%	polystyr TB	25 V
	C25	76.5059	2.2 nF 10%	polyest FL	50 V
	C26	74.5191	33 pF 5%	ceram TB	160 V
	C27	78.5044	2-18 pF	trimmer	300 V
	C28	74.5135	10 pF 5%	ceram DI	125 V
	R1	80.5255	3.3 k ohm 5%	carbon film	1/8 W
	R2	80.5243	330 ohm 5%	carbon film	1/8 W
	R3	80.5237	100 ohm 5%	carbon film	1/8 W
	R4	80.5271	68 k ohm 5%	carbon film	1/8 W
	R5	80.5259	6.8 k ohm 5%	carbon film	1/8 W
	R6	80.5237	100 ohm 5%	carbon film	1/8 W
	R7	80.5237	100 ohm 5%	carbon film	1/8 W
	R8	80.5237	100 ohm 5%	carbon film	1/8 W
	R9	80.5273	0.1 M ohm 5%	carbon film	1/8 W
	R10	80.5263	15 k ohm 5%	carbon film	1/8 W
	R11	80.5237	100 ohm 5%	carbon film	1/8 W
	R12	80.5247	680 ohm 5%	carbon film	1/8 W
	R13	80.5237	100 ohm 5%	carbon film	1/8 W
	R14	80.5243	330 ohm 5%	carbon film	1/8 W
	R15	80.5265	22 k ohm 5%	carbon film	1/8 W
	R16	80.5262	12 k ohm 5%	carbon film	1/8 W

Storno

TYPE	NO.	CODE	DATA
	L1	61.1142	RF coil 146-174 MHz
	L2	61.1143	IF coil 10.7 MHz
	L3	61.1144	RF coil 135.3 - 163.3 MHz
	L4	61.1144	RF coil 135.3 - 163.3 MHz
	L5	61.1146	RF coil 135.3 - 163.3 MHz
	L6	61.1147	RF coil 67.65 - 81.65 MHz
	L7	61.1145	RF coil 33.8 - 40.8 MHz
	L8	61.1149	RF coil 33.8 - 40.8 MHz
	Q1	99.5245	2N5245 Transistor J-FET
	Q2	99.5217	2N918 Transistor
	Q3	99.5168	BF173 Transistor
	Q4	99.5139	BSX19 Transistor

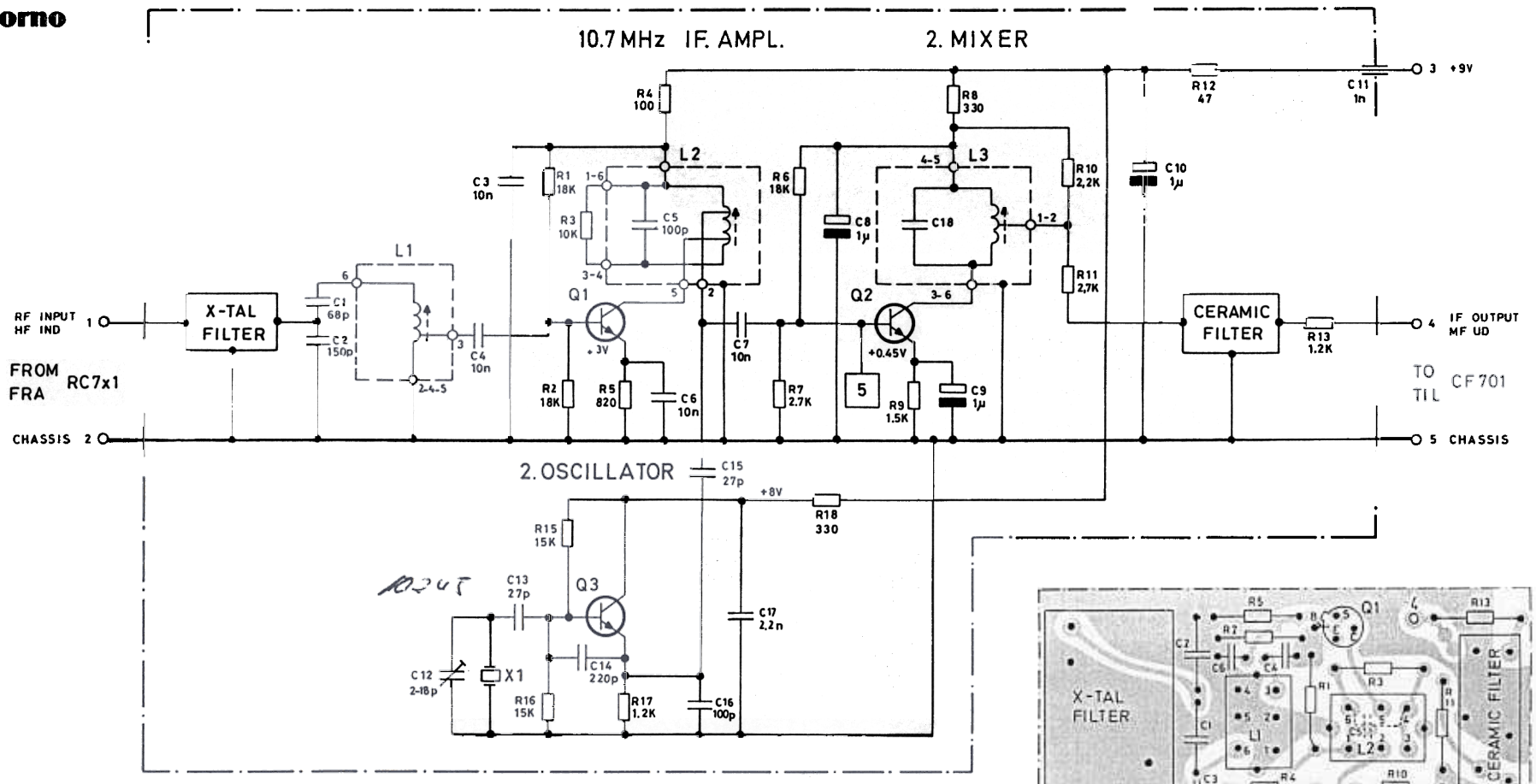
RECEIVER CONVERTER
MODTAGERKONVERTER

RC711

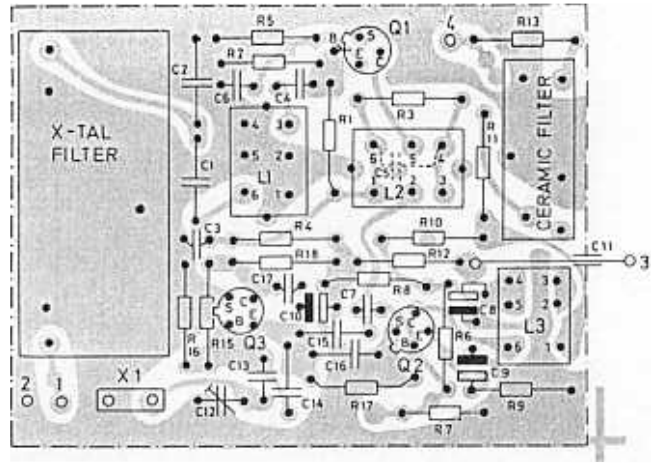
X401.382

Storno

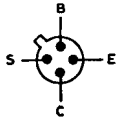
Storno



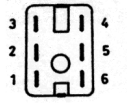
PRINTED CIRCUIT VIWED FROM COMPONENT SIDE
TRYKT KREDSLØB SET FRA KOMPONENTSIDEN.



Q1-Q3



L1-L2-L3



BOTTOM VIEW
SET FRA BUNDEN

IF CONVERTER
MF KONVERTER

IC703

D401.327/2

TYPE	NO.	CODE	DATA	
IC703		10.2432	IF Converter	
	C1	76.5101	68 pF 2.5% polystyr TB	25V
	C2	76.5103	150 pF 2.5% polystyr TB	25V
	C3	76.5070	10 nF 10% polyest. FL	50V
	C4	76.5070	10 nF 10% polyest. FL	50V
	C5	76.5102	100 pF 2.5% polystyr TB	25V
	C6	76.5070	10 nF 10% polyest. FL	50V
	C7	76.5070	10 nF 10% polyest. FL	50V
	C8	73.5114	1µF 20% tantal	35V
	C9	73.5114	1 µF 20% tantal	35V
	C10	73.5114	1 µF 20% tantal	35V
	C11	74.5167	1 nF -20 +80% ceram FT	300V
	C12	78.5044	2-18 pF trimmer	300V
	C13	74.5192	27 pF 5% ceram TB	160V
	C14	76.5104	220 pF 2.5% polystyr TB	25V
	C15	74.5107	27 pF 5% ceram TB	160V
	C16	76.5102	100 pF 2.5% polystyr TB	25V
	C17	76.5059	2.2 nF 10% polyest. FL	50V
	C18	76.5106	470 pF 2.5% polystyr	25V
	R1	80.5264	18 kΩ 5% carbon film	1/8W
	R2	80.5264	18 kΩ 5% " "	1/8W
	R3	80.5261	10 kΩ 5% " "	1/8W
	R4	80.5237	100 Ω 5% " "	1/8W
	R5	80.5248	820 Ω 5% " "	1/8W
	R6	80.5264	18 kΩ 5% " "	1/8W
	R7	80.5254	2.7 kΩ 5% " "	1/8W
	R8	80.5243	330 Ω 5% " "	1/8W
	R9	80.5254	2.7 kΩ 5% " "	1/8W
	R10	80.5234	56 Ω 5% " "	1/8W
	R11	80.5254	2.7KΩ 5% " "	1/8W
	R12	80.5233	47 Ω 5% " "	1/8W
	R13	80.5250	1.2 kΩ 5% " "	1/8W
	R15	80.5263	15 kΩ 5% " "	1/8W
	R16	80.5263	15 kΩ 5% " "	1/8W
	R17	80.5250	1.2 kΩ 5% " "	1/8W
	R18	80.5243	330 Ω 5% " "	1/8W
	L1	61.1122	IF coil 10.7 MHz	
	L2	61.1123	IF coil 10.7 MHz	
	L3	61.1302	IF coil 0.455 MHz	
	X1	98.5010	Crystal 10.2450 MHz Type 98-12	
	X1	98.5011	Crystal 11.1550 MHz Type 98-12	
		69.5016	Crystal Filter 10.7 MHz	
		69.5031	Ceramic Filter 455 kHz	

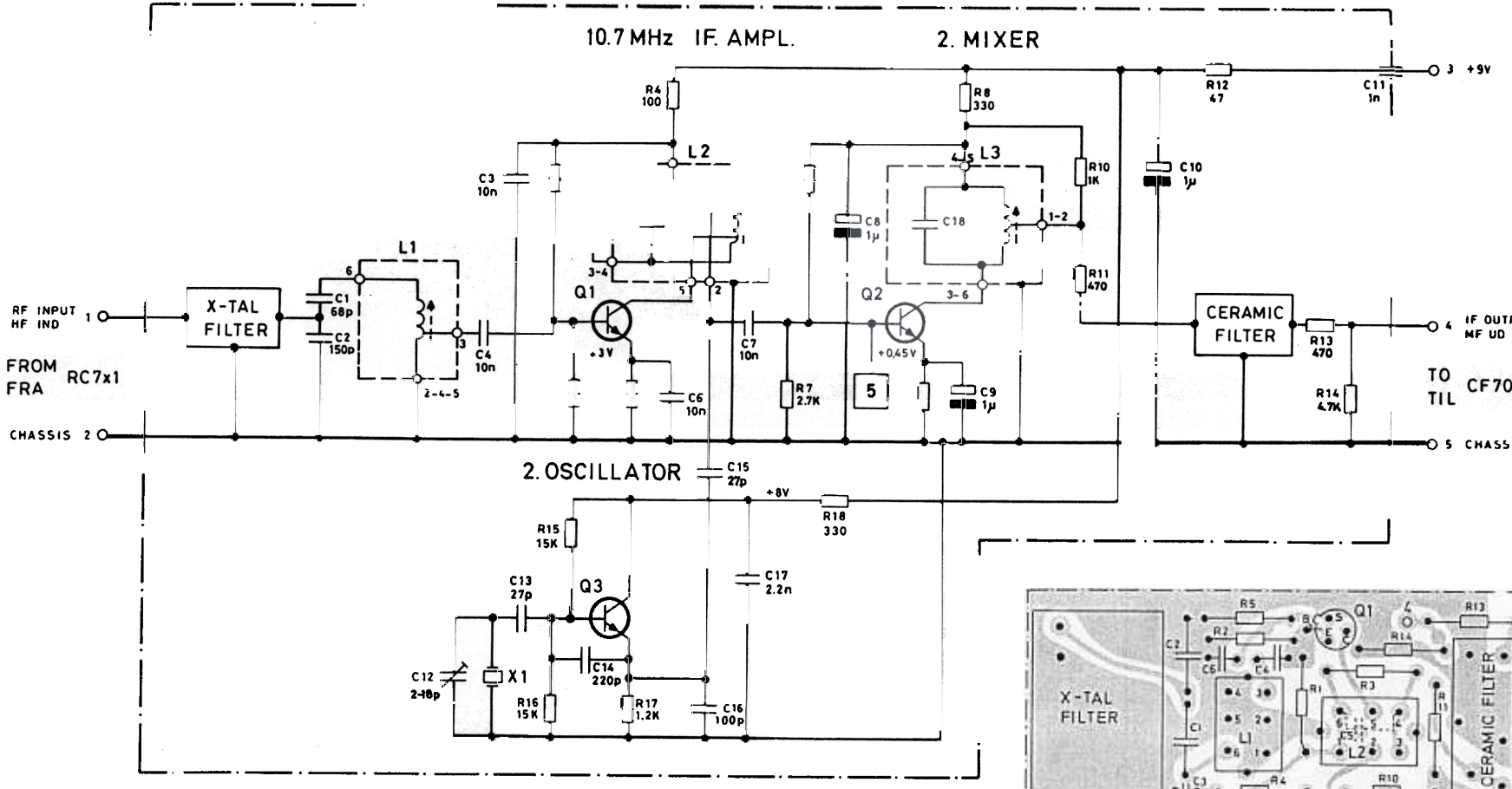
Storno

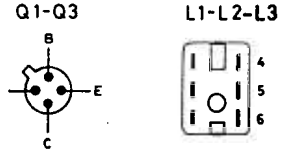
TYPE	NO.	CODE	DATA
	Q1	99.5168	BF173 Transistor
	Q2	99.5166	BF167 Transistor
	Q3	99.5168	BF173 Transistor

IF CONVERTER IC703

X401.314/4

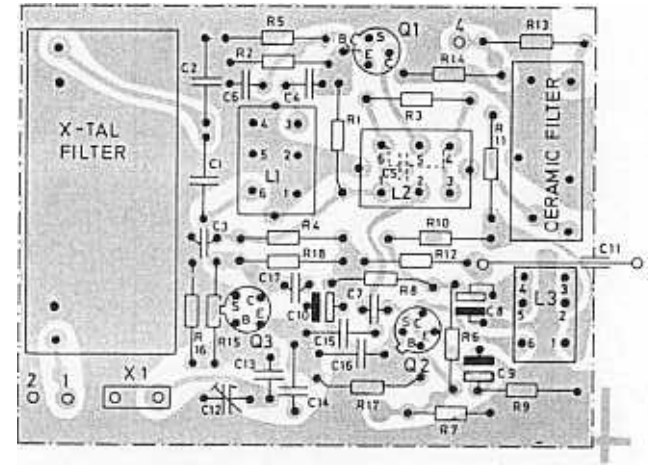
Storno





BOTTOM VIEW
SET FRA BUNDEN

PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE
TRYKT KREDSLØB SET FRA KOMPONENTSIDEN



IF CONVERTER
MF KONVERTER

IC704

D401.365/3

TYPE	NO.	CODE	DATA	
IC704		10.2517	IF Converter	
	C1	76.5101	68 pF 2.5% polystyr TB	25V
	C2	76.5103	150 pF 2.5% polystyr TB	25V
	C3	76.5070	10 nF 10% polyest. FL	50V
	C4	76.5070	10 nF 10% polyest. FL	50V
	C5	76.5102	100 pF 2.5% polystyr TB	25V
	C6	76.5070	10 nF 10% polyest. FL	50V
	C7	76.5070	10 nF 10% polyest. FL	50V
	C8	73.5114	1 µF 20% tantal	35V
	C9	73.5114	1 µF 20% tantal	35V
	C10	73.5114	1 µF 20% tantal	35V
	C11	74.5167	1 nF -20 +80% ceram FT	300V
	C12	78.5044	2-18 pF trimmer	300V
	C13	74.5192	27 pF 5% ceram TB	160V
	C14	76.5104	220 pF 2.5% polystyr TB	25V
	C15	74.5107	27 pF 5% ceram TB	160V
	C16	76.5102	100 pF 2.5% polystyr TB	25V
	C17	76.5059	2.2 nF 10% polyest. FL	50V
	C18	76.5106	470 pF 2.5% polystyr	25V
	R1	80.5264	18 kΩ 5% carbon film	1/8W
	R2	80.5264	18 kΩ 5% " "	1/8W
	R3	80.5261	10 kΩ 5% " "	1/8W
	R4	80.5237	100 Ω 5% " "	1/8W
	R5	80.5248	820 Ω 5% " "	1/8W
	R6	80.5264	18 kΩ 5% " "	1/8W
	R7	80.5254	2.7 kΩ 5% " "	1/8W
	R8	80.5243	330 Ω 5% " "	1/8W
	R9	80.5251	1.5 kΩ 5% " "	1/8W
	R10	80.5249	1 kΩ 5% " "	1/8W
	R11	80.5245	470 Ω 5% " "	1/8W
	R12	80.5233	47 Ω 5% " "	1/8W
	R13	80.5245	470 Ω 5% " "	1/8W
	R14	80.5257	4.7 kΩ 5% " "	1/8W
	R15	80.5263	15 kΩ 5% " "	1/8W
	R16	80.5263	15 kΩ 5% " "	1/8W
	R17	80.5250	1.2 kΩ 5% " "	1/8W
	R18	80.5243	330 Ω 5% " "	1/8W
	L1	61.1122	IF coil 10.7 MHz	
	L2	61.1123	IF coil 10.7 MHz	
	L3	61.1302	IF coil 0.455 MHz	
	X1	98.5010	Crystal 10.2450 MHz Type 98-12	
	X1	98.5011	Crystal 11.1550 MHz Type 98-12	

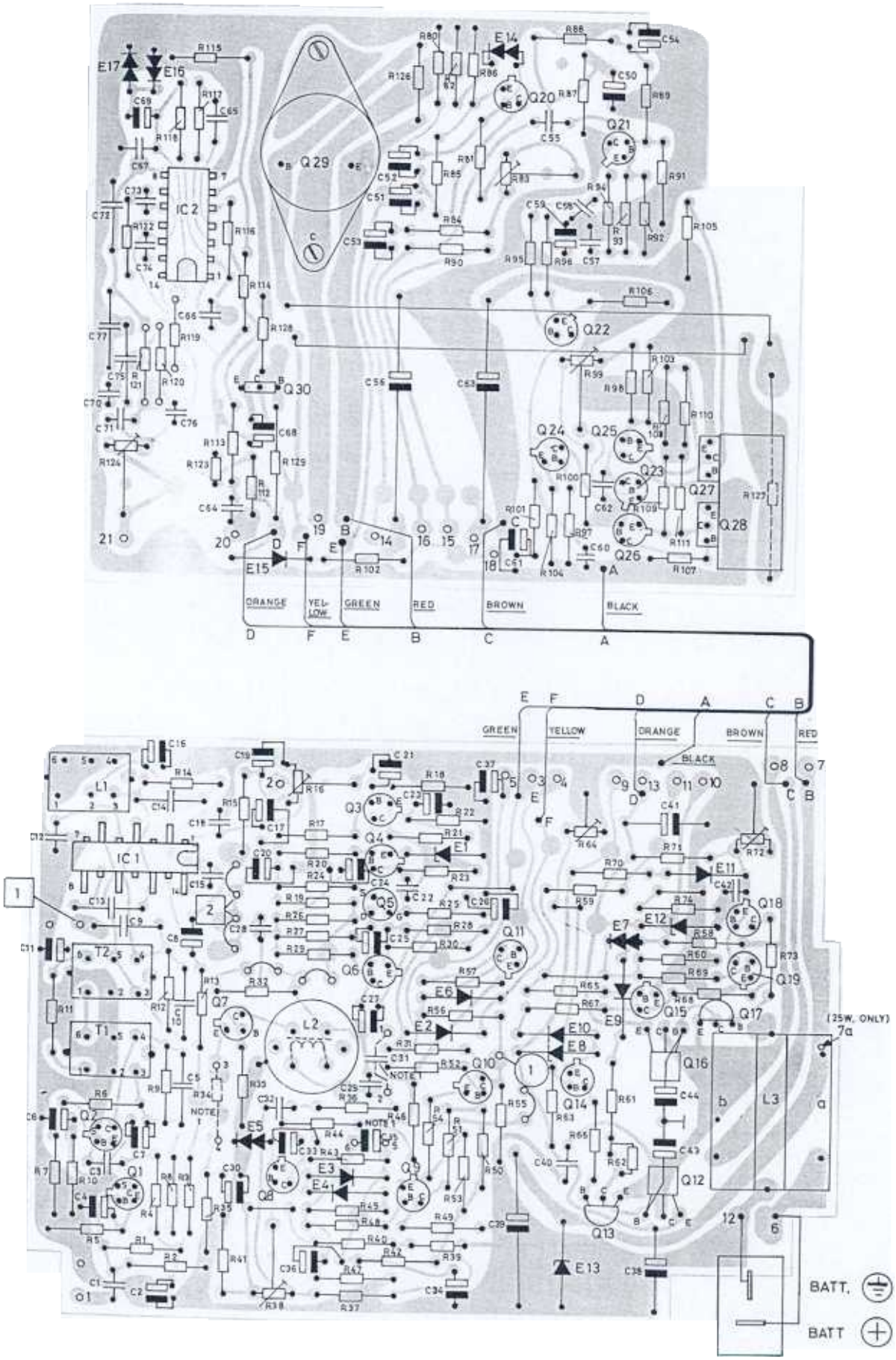
Storno

TYPE	NO.	CODE	DATA
		69.5018	Crystal Filter 10.7 MHz
		69.5014-00	Ceramic Filter 455 kHz
	Q1	99.5168	BF173 Transistor
	Q2	99.5166	BF167 Transistor
	Q3	99.5168	BF173 Transistor

IF CONVERTER
MF KONVERTER
IC704

X401.795/2

Storno



COMMON FUNCTION UNIT CF701

D401.515

TYPE	NO.	CODE	DATA	
CF701		10.2433	Common Functions Unit	
	C1	76.5071	22 nF 10% polyest. FL	50V
	C2	73.5114	1 µF 20% tantal	35V
	C3	76.5071	22 nF 10% polyest. FL	50V
	C4	73.5114	1 µF 20% tantal	35V
	C5	76.5109	1 nF 2.5% polyest. TB	25V
	C6	73.5114	1 µF 20% tantal	35V
	C7	73.5114	1 µF 20% tantal	35V
	C8	73.5106	68 µF 20% tantal	16V
	C9	76.5101	68 pF 2.5% polystyr TB	25V
	C10	76.5109	1 nF 2.5% polystyr TB	25V
	C11	73.5114	1 µF 20% tantal	35V
	C12	76.5072	47 nF 10% polyest. FL	50V
	C13	76.5101	68 pF 2.5% polystyr TB	25V
	C14	76.5109	1 nF 2.5% polystyr TB	25V
	C15	76.5069	1 nF 10% polyest FL	50V
	C16	73.5114	1 µF 20% tantal	35V
	C17	73.5109	10 µF 20% tantal	16V
	C18	76.5072	47 nF 10% polyest FL	50V
	C19	73.5114	1 µF 20% tantal	35V
	C20	73.5127	22 µF 20% tantal	16V
	C21	73.5118	0.22 µF 20% tantal	35V
	C22	76.5059	2.2 nF 10% polyest FL	50V
	C23	73.5127	22 µF 20% tantal	16V
	C24	73.5127	22 µF 20% tantal	16V
	C25	73.5114	1 µF 20% tantal	35V
	C26	73.5118	0.22 µF 20% tantal	35V
	C27	73.5109	10 µF 20% tantal	16V
	C28	76.5070	10 nF 10% polyest FL	50V
	C29	76.5060	3.3 nF 10% polyest. FL	50V
	C30	73.5109	10 µF 20% tantal	16V
	C31	76.5060	3.3 nF 10% polyest. FL	50V
	C32	76.5072	47 nF 10% polyest FL	50V
	C33	73.5126	4.7 µF 20% tantal	35V
	C34	73.5106	68 µF 20% tantal	16V
	C35	73.5125	0.47 µF 20% tantal	35V
	C36	73.5125	0.47 µF 20% tantal	35V
	C37	73.5125	0.47 µF 20% tantal	35V
	C38	73.5011	10 µF -10/+100% elco	16V
	C39	73.5071	100 µF -10/+100% elco	35V
	C40	76.5072	47nF 10% polyest FL	50V
	C41	43.5011	10 µF -10+100% elco	16V
	C42	74.5187	39pF 10% ceram N750 PL	25V
	C43	73.5114	1 µF 20% tantal	35V
	C44	73.5114	1 µF 20% tantal	35V
	C50	73.5106	68 µF 20% tantal	16V
	C51	73.5089	0.1 µF 20% tantal	35V

Storno

TYPE	NO.	CODE	DATA	
	C52	73.5089	0.1 µF 20% tantal	35V
	C53	73.5125	0.47 µF 20% tantal	35V
	C54	73.5109	10 µF 20% tantal	16V
	C55	76.5072	47 nF 10% polyest FL	50V
	C56	73.5138	470 µF -10/+50% elco	25V
	C57	76.5070	10 nF 10% polyest. FL	50V
	C58	76.5061	4.7 nF 10% polyest FL	50V
	C59	73.5127	22 µF 20% tantal	16V
	C60	76.5059	2.2 nF 10% polyest FL	50V
	C61	73.5127	22 µF 20% tantal	16V
	C62	76.5071	22 nF 10% polyest FL	50V
	C63	73.5137	470 µF -10/+50% elco	16V
	C64	76.5070	10 nF 10% polyest FL	50V
	C65	74.5165	100 pF 10% ceram PL	63V
	C66	74.5116	33 pF 5% ceram TB	160V
	C67	76.5072	47 nF 10% polyest FL	50V
	C68	73.5127	22 µF 20% tantal	16V
	C69	73.5126	4.7 µF 20% tantal	35V
	C70	76.5060	3.3 nF 10% polyest. FL	50V
	C71	76.5070	10 nF 10% polyest FL	50V
	C72	76.5104	220 pF 5% polystyr TB	25V
	C73	76.5069	1 nF 10% polyest FL	50V
	C74	74.5161	470 pF -20/+80% ceram PL	63V
	C75	76.5106	470 pF 5% polystyr TB	25V
	C76	76.5060	3.3 nF 10% polyest. FL	50V
	C77	76.5090	47 pF 5% polystyr	63V
	R1	80.5260	8.2 kΩ 5% carbon film	1/8W
	R2	80.5254	2.7 kΩ 5% " "	1/8W
	R3	80.5246	560 Ω 5% " "	1/8W
	R4	80.5255	3.3 kΩ 5% " "	1/8W
	R5	80.5249	1 kΩ 5% " "	1/8W
	R6	80.5253	2.2 kΩ 5% " "	1/8W
	R7	80.5258	5.6 kΩ 5% " "	1/8W
	R8	80.5259	6.8 kΩ 5% " "	1/8W
	R9	80.5257	4.7 kΩ 5% " "	1/8W
	R10	80.5249	1 kΩ 5% " "	1/8W
	R11	80.5218	2.7 Ω 5% " "	1/8W
	R12	80.5258	5.6 kΩ 5% " "	1/8W
	R13	80.5230	27 Ω 5% " "	1/8W
	R14	80.5254	2.7 kΩ 5% " "	1/8W
	R15	80.5253	2.2 kΩ 5% " "	1/8W

COMMON FUNCTIONS UNIT CF701

TYPE	NO.	CODE	DATA	
	R16	86.5039	10 kΩ 20% potentiometer	0.1W
	R17	80.5272	82 kΩ 5% carbon film	1/8W
	R18	80.5266	27 kΩ 5% " "	1/8W
	R19	80.5243	330 Ω 5% " "	1/8W
	R20	80.5266	27 kΩ 5% " "	1/8W
	R21	80.5240	180 Ω 5% " "	1/8W
	R22	80.5254	2.7 kΩ 5% " "	1/8W
	R23	80.5261	10 kΩ 5% " "	1/8W
	R24	80.5249	1 kΩ 5% " "	1/8W
	R25	80.5273	0.1 MΩ 5% " "	1/8W
	R26	80.5244	390 Ω 5% " "	1/8W
	R27	80.5264	18 kΩ 5% " "	1/8W
	R28	80.5258	5.6 kΩ 5% " "	1/8W
	R29	80.5247	680 Ω 5% " "	1/8W
	R30	80.5241	220 Ω 5% " "	1/8W
	R31	80.5267	33 kΩ 5% " "	1/8W
	R32	80.5269	47 kΩ 5% " "	1/8W
	R33	80.5265	22 kΩ 5% " "	1/8W
	R34	80.5244	390 Ω 5% " "	1/8W
	R35	80.5248	820 Ω 5% " "	1/8W
	R36	80.5261	10 kΩ 5% " "	1/8W
	R37	80.5278	0.27 MΩ 5% " "	1/8W
	R38	86.5044	25 kΩ 20% potentiometer	0.1W
	R39	89.5010	15 kΩ 2% NTC	0.6W
	R40	80.5263	15 kΩ 5% carbon film	1/8W
	R41	80.5261	10 kΩ 5% " "	1/8W
	R42	80.5238	120 Ω 5% " "	1/8W
	R43	80.5245	470 Ω 5% " "	1/8W
	R44	80.5248	820 Ω 5% " "	1/8W
	R45	80.5256	3.9 kΩ 5% " "	1/8W
	R46	80.5269	47 kΩ 5% " "	1/8W
	R47	80.5280	0.39 MΩ 5% " "	1/8W
	R48	80.5261	10 kΩ 5% " "	1/8W
	R49	80.5262	12 kΩ 5% " "	1/8W
	R50	80.5266	27 kΩ 5% " "	1/8W
	R51	80.5266	27 kΩ 5% " "	1/8W
	R52	80.5266	27 kΩ 5% " "	1/8W
	R53	80.5252	1.8 kΩ 5% " "	1/8W
	R54	80.5243	330 Ω 5% " "	1/8W
	R55	80.5258	5.6 kΩ 5% " "	1/8W
	R56	80.5263	15kΩ 5% " "	1/8W
	R57	80.5240	180 Ω 5% " "	1/8W
	R58	80.5254	2.7 kΩ 5% " "	1/8W
	R59	80.5261	10 kΩ 5% " "	1/8W
	R60	80.5265	22 kΩ 5% " "	1/8W
	R61	80.5249	1 kΩ 5% " "	1/8W
	R62	89.5046	50 Ω PTC	
	R63	80.5246	560 Ω 5% " "	1/8W

TYPE	NO.	CODE	DATA	
	R64	86.5068	1 kΩ 20% potentiometer	0.1W
	R65	80.5264	18 kΩ 5% carbon film	1/8W
	R66	80.5272	82 kΩ 5% " "	1/8W
	R67	80.5254	2.7 kΩ 5% " "	1/8W
	R68	80.5262	12 kΩ 5% " "	1/8W
	R69	80.5257	4.7 kΩ 5% " "	1/8W
	R70	80.5254	2.7 kΩ 5% " "	1/8W
	R71	80.5246	560 Ω 5% " "	1/8W
	R72	86.5058	1 kΩ 20% potentiometer	0,1W
	R73	80.5272	82 kΩ 5% carbon film	1/8W
	R74	80.5254	2.7 kΩ 5% " "	1/8W
	R80	80.5246	560 Ω 5% " "	1/8W
	R81	80.5275	0.15 MΩ 5% " "	1/8W
	R82	80.5267	33 kΩ 5% " "	1/8W
	R83	86.5042	500 Ω 20% potentiometer	0.1W
	R84	80.5238	120 Ω 5% carbon film	1/8W
	R85	80.5254	2.7 kΩ 5% " "	1/8W
	R86	80.5238	120 Ω 5% " "	1/8W
	R87	80.5240	180 Ω 5% " "	1/8W
	R88	80.5269	47 kΩ 5% " "	1/8W
	R89	80.5269	47 kΩ 5% " "	1/8W
	R90	80.5261	10 kΩ 5% " "	1/8W
	R91	80.5273	0.1 MΩ 5% " "	1/8W
	R92	80.5258	5.6 kΩ 5% " "	1/8W
	R93	80.5249	1 kΩ 5% " "	1/8W
	R94	80.5249	1 kΩ 5% " "	1/8W
	R95	80.5256	3.9 kΩ 5% " "	1/8W
	R96	80.5233	47 Ω 5% " "	1/8W
	R97	80.5251	1.5 kΩ 5% " "	1/8W
	R98	80.5250	1.2 kΩ 5% " "	1/8W
	R99	86.5043	2.5 kΩ 20% potentiometer	0.1W
	R100	80.5254	2.7 kΩ 5% carbon film	1/8W
	R101	80.5262	12 kΩ 5% " "	1/8W
	R102	80.5253	2.2kΩ 5% " "	1/8W
	R103	80.5253	2.2 kΩ 5% " "	1/8W
	R104	80.5225	10 Ω 5% " "	1/8W
	R105	80.5242	270 Ω 5% " "	1/8W
	R106	80.5253	2.2 kΩ 5% " "	1/8W
	R107	80.5242	270 Ω 5% " "	1/8W
	R108	80.5213	1 Ω 5% " "	1/8W
	R109	80.5213	1 Ω 5% " "	1/8W
	R110	80.5213	1 Ω 5% " "	1/8W

COMMON FUNCTIONS UNIT CF701

TYPE	NO.	CODE	DATA	
	R111	80.5213	1 Ω 5% carbon film	1/8W
	R112	80.5246	560 Ω 5% " "	1/8W
	R113	80.5254	2.7 kΩ 5% " "	1/8W
	R114	89.5062	22 kΩ 1% metal film	1/8W
	R115	89.5062	22 kΩ 1% metal film	1/8W
	R116	80.5280	0.39 MΩ 5% carbon film	1/8W
	R117	80.5259	6.8 kΩ 5% " "	1/8W
	R118	80.5263	15 kΩ 5% " "	1/8W
	R119	89.5062	22 kΩ 1% metal film	1/8W
	R120	89.5062	22 kΩ 1% metal film	1/8W
	R121	89.5062	22 kΩ 1% metal film	1/8W
	R122	80.5251	1.5 kΩ 5% carbon film	1/8W
	R123	89.5061	68 Ω 20% NTC	0.5W
	R124	86.5044	25 kΩ 20% potentiometer	0.1W
	R126	80.5229	22 Ω 5% carbon film	1/8W
	R127	84.5224	82 Ω 5% wire wound	4W
	R128	80.5238	120 Ω 5% carbon film	1/8W
	R129	80.5443	330 Ω 5% " "	1/4W
	L1	61.1131	IF coil 455 kHz	
	L2	61.1132	Coil 75 mH	
	L3	60.5158	Cnoke	
	T1	61.1130	IF Transformer 455 kHz	
	T2	61.1130	IF Transformer 455 kHz	
	E1	99.5210	Zenerdiode 3.3V 5%	1/4W
	E2	99.5237	1N4148 Diode	
	E3	99.5237	1N4148 Diode	
	E4	99.5237	1N4148 Diode	
	E5	99.5209	Stab. diode 1.5V	
	E6	99.5237	1N4148 Diode	
	E7	99.5209	Stab. diode 1.5V	
	E8	99.5224	Zenerdiode 4.7V 5%	1/4W
	E9	99.5237	1N4148 Diode	
	E10	99.5237	1N4148 Diode	
	E11	99.5237	1N4148 Diode	
	E12	99.5224	Zenerdiode 4.7V 5%	1/4W
	E13	99.5249	Zenerdiode BZY93/C20R	
	E14	99.5209	Stab. diode 1.5V	
	E15	99.5237	1N4148 Diode	
	E16	99.5209	Stab. diode 1.5V	
	E17	99.5209	Stab. diode 1.5V	
	Q1	99.5166	BF167 Transistor	
	Q2	99.5166	BF167 Transistor	
	Q3	99.5143	BC108 Transistor	
	Q4	99.5143	BC108 Transistor	

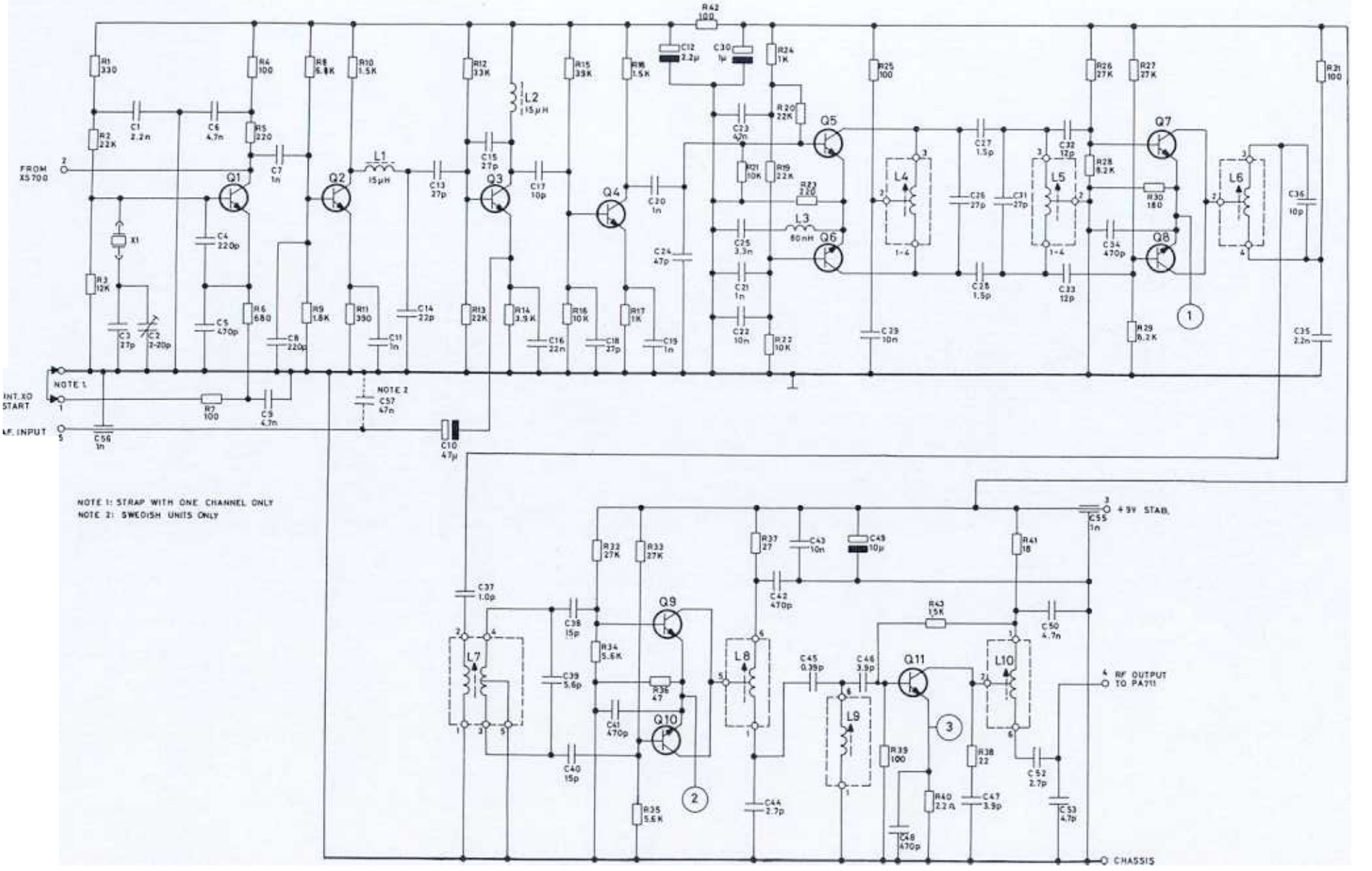
Storno

TYPE	NO.	CODE	DATA
	Q5	99.5247	2N4302 Transistor FET
	Q6	99.5143	BC108 Transistor
	Q7	99.5143	BC108 Transistor
	Q8	99.5143	BC108 Transistor
	Q9	99.5115	BC179 Transistor
	Q10	99.5115	BC179 Transistor
	Q11	99.5143	BC108 Transistor
	Q12	99.5246	TIP 31 Transistor
	Q13	99.5144-01	BC214L Transistor
	Q14	99.5243	BC108 Transistor
	Q15	99.5243	BC108 Transistor
	Q16	99.5246	TIP 31 Transistor
	Q17	99.5144-01	BC214L Transistor
	Q18	99.5143	BC108 Transistor
	Q19	99.5143	BC108 Transistor
	Q20	99.5201	BC109 Transistor
	Q21	99.5201	BC109 Transistor
	Q22	99.5115	BC179 Transistor
	Q23	99.5143	BC108 Transistor
	Q24	99.5143	BC108 Transistor
	Q25	99.5143	BC108 Transistor
	Q26	99.5115	BC179 Transistor
	Q27	99.5236	BD136 Transistor
	Q28	99.5235	BD135 Transistor
	Q29	99.5248	SP2629 Transistor
	Q30	99.5235	BD135 Transistor
	IC1	14.5010	IF ampl./discr.
	IC2	14.5006	MC1437P dual OP amp.

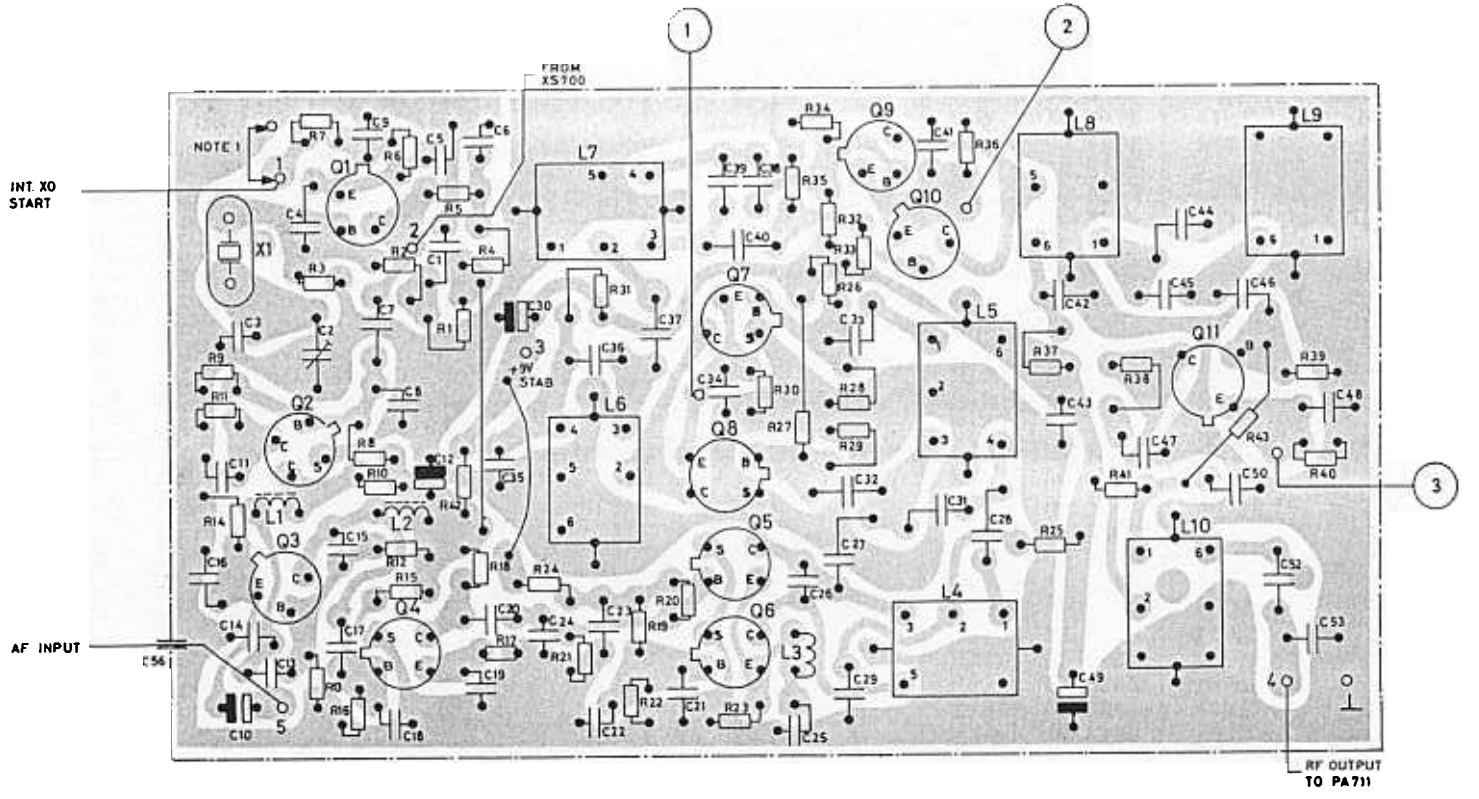
COMMON FUNCTIONS UNIT CF701

X401.322/2

Storno


FROM X5700
INT. XO START
AF. INPUT
NOTE 1
NOTE 2
C57 47n
C56 1n
C10 47µ
NOTE 1: STRAP WITH ONE CHANNEL ONLY
NOTE 2: SWEDISH UNITS ONLY
+9V STAB.
RF OUTPUT TO PA711
CHASSIS
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
L1 15µH
L2 15µH
L3 80nH
L4
L5
L6
L7
L8
L9
L10
X1
R1 330
R2 22K
R3 12K
R4 100
R5 220
R6 680
R7 100
R8 6.8K
R9 1.8K
R10 1.5K
R11 390
R12 33K
R13 22K
R14 3.9K
R15 39K
R16 10K
R17 1K
R18 1.5K
R19 22K
R20 22K
R21 10K
R22 10K
R23 220
R24 1K
R25 100
R26 27K
R27 27K
R28 8.2K
R29 8.2K
R30 180
R32 27K
R33 27K
R34 5.6K
R35 5.6K
R36 47
R37 27
R38 22
R39 100
R40 2.2A
R41 18
R42 100
R43 1.5K
C1 2.2n
C2 3-20p
C3 27p
C4 220p
C5 470p
C6 4.7n
C7 1n
C8 220p
C9 4.7n
C11 1n
C12 2.2µ
C13 27p
C14 22p
C15 27p
C16 22n
C17 10p
C18 27p
C19 1n
C20 1n
C21 1n
C22 10n
C23 47n
C24 47p
C25 3.3n
C26 27p
C27 1.5p
C28 1.5p
C29 10n
C30 1µ
C31 27p
C32 12p
C33 12p
C34 470p
C35 2.2n
C36 10p
C37 1.0p
C38 15p
C39 5.6p
C40 15p
C41 470p
C42 470p
C43 10n
C44 2.7p
C45 0.39p
C46 3.9p
C47 3.9p
C48 470p
C49 10µ
C50 4.7n
C52 2.7p
C53 4.7p
C55 1n

Storno



PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE

EXCITER EX711

D401.521/2

TYPE	NO.	CODE	DATA	
EX711		10.2570	Exciter Unit	
	C1	76.5059	2.2 nF 10% polyest. FL	50V
	C2	78.5046	2-20 pF trimmer	
	C3	74.5192	27 pF 5% ceram TB	160V
	C4	76.5104	220 pF 2.5% polystyr TB	25V
	C5	76.5106	470 pF 2.5% polystyr TB	25V
	C6	76.5061	4.7 nF 10% polyest FL	50V
	C7	74.5155	1 nF -20 +80% ceram PL	63V
	C8	76.5104	220 pF 2.5% polystyr TB	25V
	C9	76.5061	4.7 nF 10% polyest. FL	50V
	C10	73.5124	47 µF 20% tantal	6.3V
	C11	76.5069	1 nF 10% polyest. FL	50V
	C12	73.5129	2.2 µF -20 +50% tantal	10V
	C13	74.5107	27 pF 5% ceram	160V
	C14	74.5106	22 pF 5% ceram	160V
	C15	74.5107	27 pF 5% ceram	160V
	C16	76.5071	22 nF 10% polyest. FL	50V
	C17	74.5135	10 pF 5% ceram DI	250V
	C18	74.5107	27 pF 5% ceram	160V
	C19	76.5069	1 nF 10% polyest. FL	50V
	C20	74.5155	1 nF -20 +80% ceram PL	63V
	C21	74.5155	1 nF -20 +80% ceram PL	63V
	C22	76.5070	10 nF 10% polyest FL	50V
	C23	76.5061	4.7 nF 10% polyest. FL	50V
	C24	74.5186	47 pF 10% ceram PL	25V
	C25	76.5060	3.3 nF 10% polyest. FL	50V
	C26	74.5107	27 pF 5% ceram	160V
	C27	74.5125	1.5 pF ±0.25 pF ceram BD	250V
	C28	74.5125	1.5 pF ±0.25 pF ceram BD	250V
	C29	76.5070	10 nF 10% polyest. FL	50V
	C30	73.5135	1 µF -20 +50% tantal	16V
	C31	74.5107	27 pF 5% ceram	160V
	C32	74.5136	12 pF 5% ceram DI	250V
	C33	74.5136	12 pF 5% ceram DI	250V
	C34	74.5161	470 pF -20 +80% ceram PL	63V
	C35	76.5059	2.2 nF 10% polyest FL	50V
	C36	74.5135	10 pF 5% ceram DI	250V
	C37	74.5123	1.0 pF ±0.25 pF ceram BD	250V
	C38	74.5137	15 pF 5% ceram DI	125V
	C39	74.5132	5.6 pF ±0.25 pF ceram DI	250V
	C40	74.5137	15 pF 5% ceram DI	125V
	C41	74.5161	470 pF -20 +80% ceram PL	63V
	C42	74.5161	470 pF -20 +80% ceram PL	63V
	C43	76.5070	10 nF 10% polyest. PL	50V
	C44	74.5128	2.7 pF ±0.25 pF ceram DI	250V
	C45	74.5120	0.39 pF ±0.1 pF ceram BD	250V
	C46	74.5130	3.9 ±0.25 pF ceram DI	250V

TYPE	NO	CODE	DATA	
	C47	74.5130	3.9 pF ±0.25 pF ceram DI	250V
	C48	74.5161	470 pF -20 +80% ceram PL	63V
	C49	73.5109	10 µF 20% tantal	16V
	C50	76.5061	4.7 nF 10% polyest. FL	50V
	C51			
	C52	74.5128	2.7 pF ±0.25 pF ceram DI	250V
	C53	74.5131	4.7 pF ±0.25 pF ceram DI	250V
	C54			
	C55	74.5167	1 nF -20 +80% ceram FT	300V
	C56	74.5167	1 nF -20 +80% ceram FT	300V
	C57	76.5072	47nF 10% Polyest. FL (Swedish units only)	50V
	R1	80.5243	330 Ω 5% carbon film	1/8W
	R2	80.5265	22 kΩ 5% " "	1/8W
	R3	80.5262	12 kΩ 5% " "	1/8W
	R4	80.5237	100 Ω 5% " "	1/8W
	R5	80.5241	220 Ω 5% " "	1/8W
	R6	80.5247	680 Ω 5% " "	1/8W
	R7	80.5237	100 Ω 5% " "	1/8W
	R8	80.5259	6.8 kΩ 5% " "	1/8W
	R9	80.5252	1.8 kΩ 5% " "	1/8W
	R10	80.5251	1.5 kΩ 5% " "	1/8W
	R11	80.5244	390 Ω 5% " "	1/8W
	R12	80.5267	33 kΩ 5% " "	1/8W
	R13	80.5265	22 kΩ 5% " "	1/8W
	R14	80.5256	3.9 kΩ 5% " "	1/8W
	R15	80.5268	39 kΩ 5% " "	1/8W
	R16	80.5261	10 kΩ 5% " "	1/8W
	R17	80.5249	1 kΩ 5% " "	1/8W
	R18	80.5251	1.5 kΩ 5% " "	1/8W
	R19	80.5265	22 kΩ 5% " "	1/8W
	R20	80.5265	22 kΩ 5% " "	1/8W
	R21	80.5261	10 kΩ 5% " "	1/8W
	R22	80.5261	10 kΩ 5% " "	1/8W
	R23	80.5241	220 Ω 5% " "	1/8W
	R24	80.5249	1 kΩ 5% " "	1/8W
	R25	80.5237	100 Ω 5% " "	1/8W
	R26	80.5266	27 kΩ 5% " "	1/8W
	R27	80.5266	27 kΩ 5% " "	1/8W
	R28	80.5260	8.2 kΩ 5% " "	1/8W
	R29	80.5260	8.2 kΩ 5% " "	1/8W
	R30	80.5240	180 Ω 5% " "	1/8W
	R31	80.5237	100 Ω 5% " "	1/8W
	R32	80.5266	27 kΩ 5% " "	1/8W

EXCITER UNIT
STYRESENDER

EX711

X401.371/2

TYPE	NO.	CODE	DATA	
	R33	80.5266	27 kΩ 5% carbon film	1/8W
	R34	80.5258	5.6 kΩ 5% " "	1/8W
	R35	80.5258	5.6 kΩ 5% " "	1/8W
	R36	80.5233	47 Ω 5% " "	1/8W
	R37	80.5230	27 Ω 5% " "	1/8W
	R38	80.5229	22 Ω 5% " "	1/8W
	R39	80.5237	100 Ω 5% " "	1/8W
	R40	80.5217	2.2 Ω 5% " "	1/8W
	R41	80.5228	18 Ω 5% " "	1/8W
	R42	80.5237	100 Ω 5% " "	1/8W
	R43	80.5051	1.5KΩ 5% " "	1/10W
	L1	63.5007	15 µA 10% RF choke	0.5A
	L2	63.5007	15 µH 10% " "	0.5A
	L3	62.0651-01	0.08 µH 20% RF choke	
	L4	61.1113	RF coil 37 MHz	
	L5	61.1113	RF coil 37 MHz	
	L6	61.1150	RF coil 74 MHz	
	L7	61.1151	RF coil 74 MHz	
	L8	61.1152-01	RF coil 148 MHz	
	L9	61.1153	RF coil 148 MHz	
	L10	61.1154	RF coil 148 MHz	
	Q1	99.5139	BSX19 Transistor	
	Q2	99.5168	BF173 Transistor	
	Q3	99.5121	BC107 Transistor	
	Q4	99.5175	BF185 Transistor	
	Q5	99.5175	BF185 Transistor	
	Q6	99.5175	BF185 Transistor	
	Q7	99.5175	BF185 Transistor	
	Q8	99.5175	BF185 Transistor	
	Q9	99.5139	BSX19 Transistor	
	Q10	99.5139	BSX19 Transistor	
	Q11	99.5229	2N4427 Transistor	
	C57	76.5072	47nF 10% polyest. FL (Swedish units only)	50V

Storno

TYPE	NO.	CODE	DATA

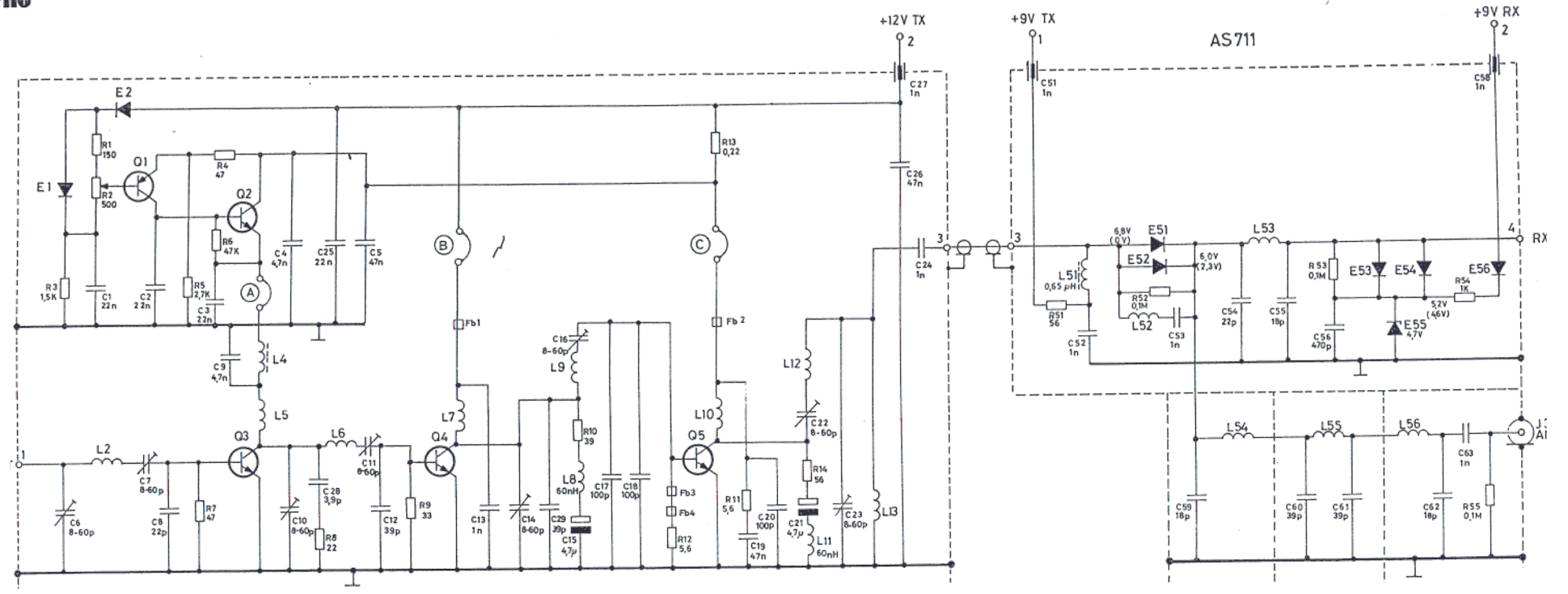
EXCITER UNIT
STYRESENDER

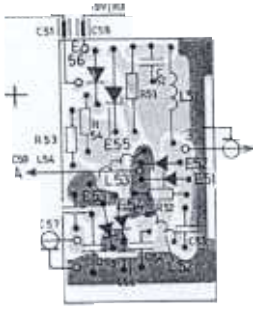
EX711

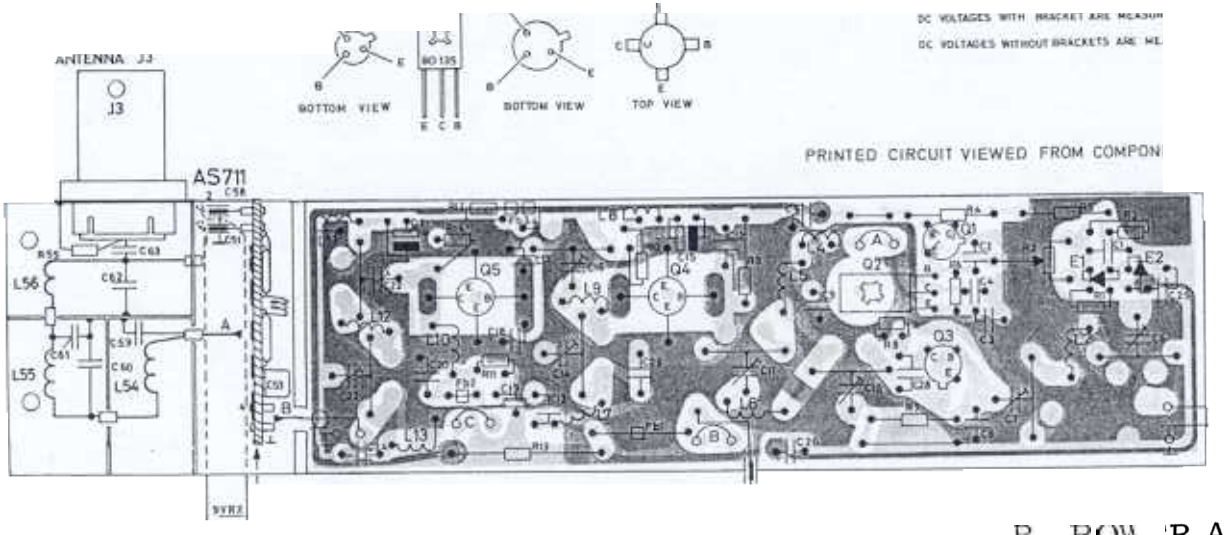
X401.371/2

Storno

Storno







R POW RA F R
HF 'EKTFOR TÆRKER P

D401.710

TYPE	NO.	CODE	DATA	
PA711		10.2558	Power Amplifier (incl. AS711)	
AS711		10.2553	Antenna Switch	
	C1	76.5061	4.7 nF 10% polyest FL	50 V
	C2	76.5061	4.7 nF 10% polyest FL	50 V
	C3	76.5061	4.7 nF 10% polyest FL	50 V
	C4	76.5061	4.7 nF 10% polyest FL	50 V
	C5	76.5072	47 nF 10% polyest FL	50 V
	C6	78.5052	8-60 pF trimmer	100 V
	C7	78.5052	8-60 pF trimmer	100 V
	C8	74.5106	22 pF 5% ceram TB	160 V
	C9	76.5061	4.7 nF 10% polyest FL	50 V
	C10	78.5052	8-60 pF trimmer	100 V
	C11	78.5052	8-60 pF trimmer	100 V
	C12	74.5117	39 pF 5% ceram TB	160 V
	C13	74.5155	1 nF -20+50% ceram PL	63 V
	C14	78.5052	8-60 pF trimmer	100 V
	C15	73.5126	4.7 µF 20% tantal	35 V
	C16	78.5052	8-60 pF trimmer	100 V
	C17	74.5199	100 pF 20% ceram PL	25 V
	C18	74.5199	100 pF 20% ceram PL	25 V
	C19	76.5052	47 nF 10% polyest FL	50 V
	C20	74.5013	100 pF 20% ceram DI	400 V
	C21	73.5126	4.7 µF 20% tantal	35 V
	C22	78.5052	8-60 pF trimmer	100 V
	C23	78.5052	8-60 pF trimmer	400 V
	C24	74.5015	1 nF-20+50% ceram DI	400 V
	C25	76.5061	4.7 nF polyest FL	50 V
	C26	76.5072	47 nF 10% polyest FL	50 V
	C28	74.5130	3.9 pF ± 25 pF 5% ceram DI	250 V
	C29	74.5117	39 pF 5% ceram TB	160 V
	R1	80.5239	150 Ω 5% carbon film	1/8 W
	R2	86.5042	500 Ω 20% potentiometer	0.1 W
	R3	80.5251	1.5 KΩ 5% carbon film	1/8 W
	R4	80.5233	47 Ω 5% carbon film	1/8 W
	R5	80.5254	2.7 KΩ 5% carbon film	1/8 W
	R6	80.5269	47 KΩ 5% carbon film	1/8 W
	R7	80.5233	47 Ω 5% carbon film	1/8 W
	R8	80.5229	22 Ω 5% carbon film	1/8 W
	R9	80.5231	33 Ω 5% carbon film	1/8 W
	R10	80.5432	39 Ω 5% carbon film	1/4 W
	R11	80.5222	5.6 Ω 5% carbon film	1/8 W
	R12	80.5222	5.6 Ω 5% carbon film	1/8 W
	R13	82.5205	0.22 Ω 10% wire wound	1 W
	R14	80.5434	56 Ω 5% carbon film	1/4 W
	L2	62.0822	RF coil 146-174 MHz	

Storno

TYPE	NO.	CODE	DATA	
	L4	63.5008	0.47 µH 20% RF choke	
	L5	62.0822	RF coil 146-174 MHz	
	L6	62.0823	RF coil 146-174 MHz	
	L7	62.0824	RF coil 146-174 MHz	
	L8	61.5011	0.06 µH 20% RF choke	
	L9	62.0825	RF-coil 146-174 MHz	
	L10	62.0824	RF coil 146-174 MHz	
	L11	61.5011	0.06 µH 20% RF choke	
	L12	62.0827	RF coil 146-174 MHz	
	L13	62.0826	RF coil 146-174 MHz	
	E1	99.5028	1N914 Diode	
	E2	99.5028	1N914 Diode	
	Q1	99.5230	BC178 Transistor	
	Q2	99.5235	BD135 Transistor	
	Q3	99.5229	2N4427 Transistor	
	Q4	99.5252	BLY87A Transistor	
	Q5	99.5253	BLY88A Transistor	
AS711		10.2553	Antenna Switch	
	C51	69.5007	VHF feed-through filter	
	C52	74.5155	1nF -20+80% ceram PL	63 V
	C53	74.5155	1 nF -20+80% ceram PL	63 V
	C54	74.5008	22 pF ± 5% ceram DI	400 V
	C55	74.5138	18 pF 5% ceram DI	125 V
	C56	74.5162	470 pF-20+50% ceram DI	400 V
	C57	74.5155	1 nF -20+80%ceram PL	63V
	C58	69.5007	VHF feed-through filter	
	C59	74.5796	18 pF 5% ceram DI	400 V
	C60	74.5197	39 pF 5% ceram DI	400 V
	C61	74.5197	39 pF 5% ceram DI	400 V
	C62	74.5196	10 pF 5% ceram DI	400 V
	C63	74.5015	1 nF 20% ceram DI	400 V
	R51	80.5234	56 Ω 5% carbon film	1/8 W
	R52	80.5073	0.1 MΩ 5% carbon film	0.1 W
	R53	80.5073	0.1 MΩ 5% carbon film	0.1 W
	R54	80.5049	1 KΩ 5% carbon film	0.1 W
	R55	80.5273	0.1 MΩ 5% carbon film	1/8 W
	L51	62.0662-01	0.65 µH RF choke	
	L52	62.0818	RF coil	

POWER AMPLIFIER
EFFEKTFORSTÆRKER

PA711

X401.782

TYPE	NO.	CODE	DATA
	L53	62.0817	RF coil
	L54		
	L55	62.0816	RF coil
	L56		
	E51	99.5244	BA182 Diode
	E52	99.5244	BA182 Diode
	E53	99.5244	BA182 Diode
	E54	99.5244	BA182 Diode
	E55	99.5224	4.7 V 5% zenerdiode 0.25W
	E56	99.5237	1N4148 Diode

Storno

TYPE	NO.	CODE	DATA

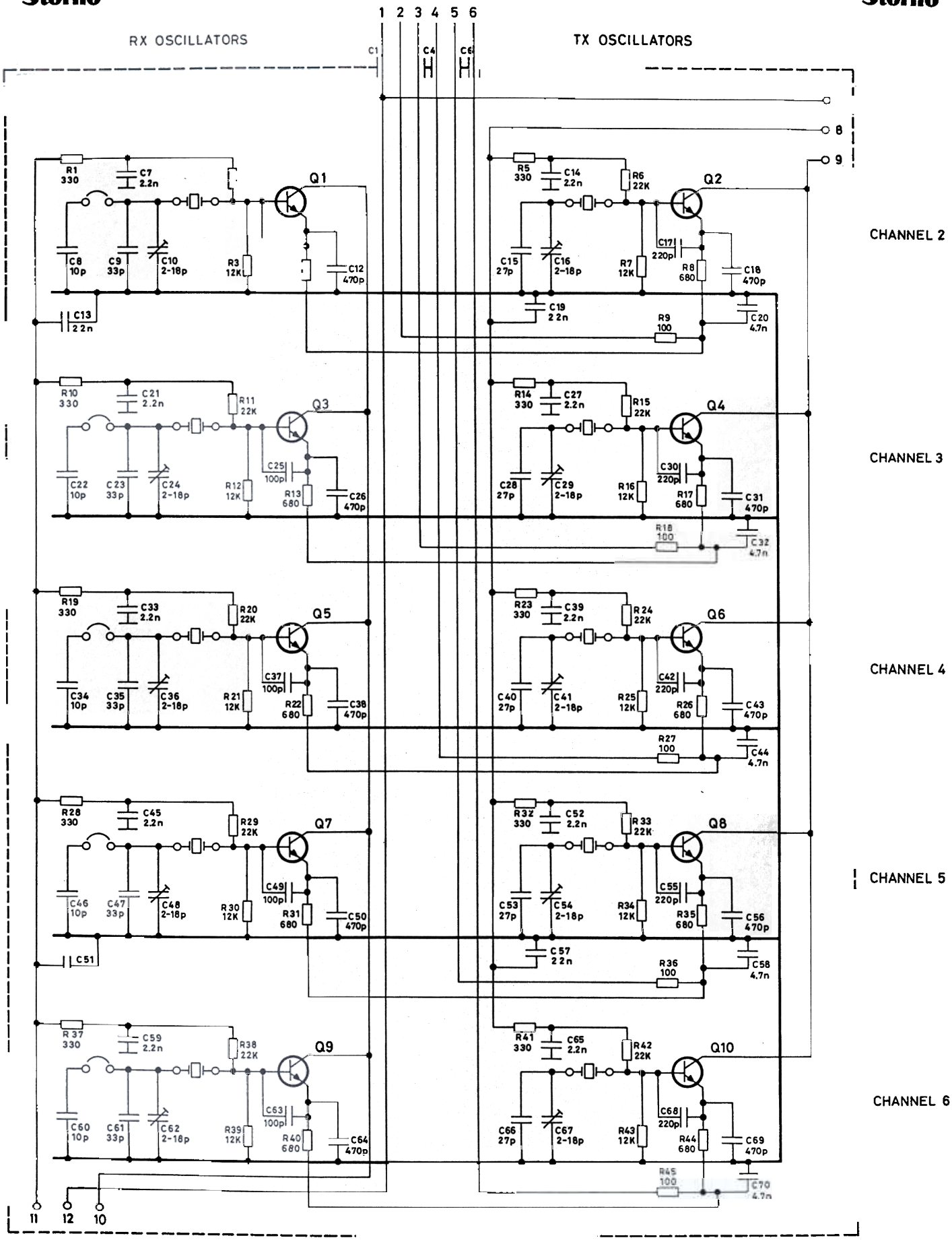
POWER AMPLIFIER
EFFEKTFORSTÆRKER

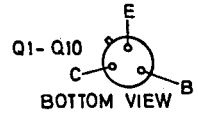
PA711

X401.782

Storno

Storno

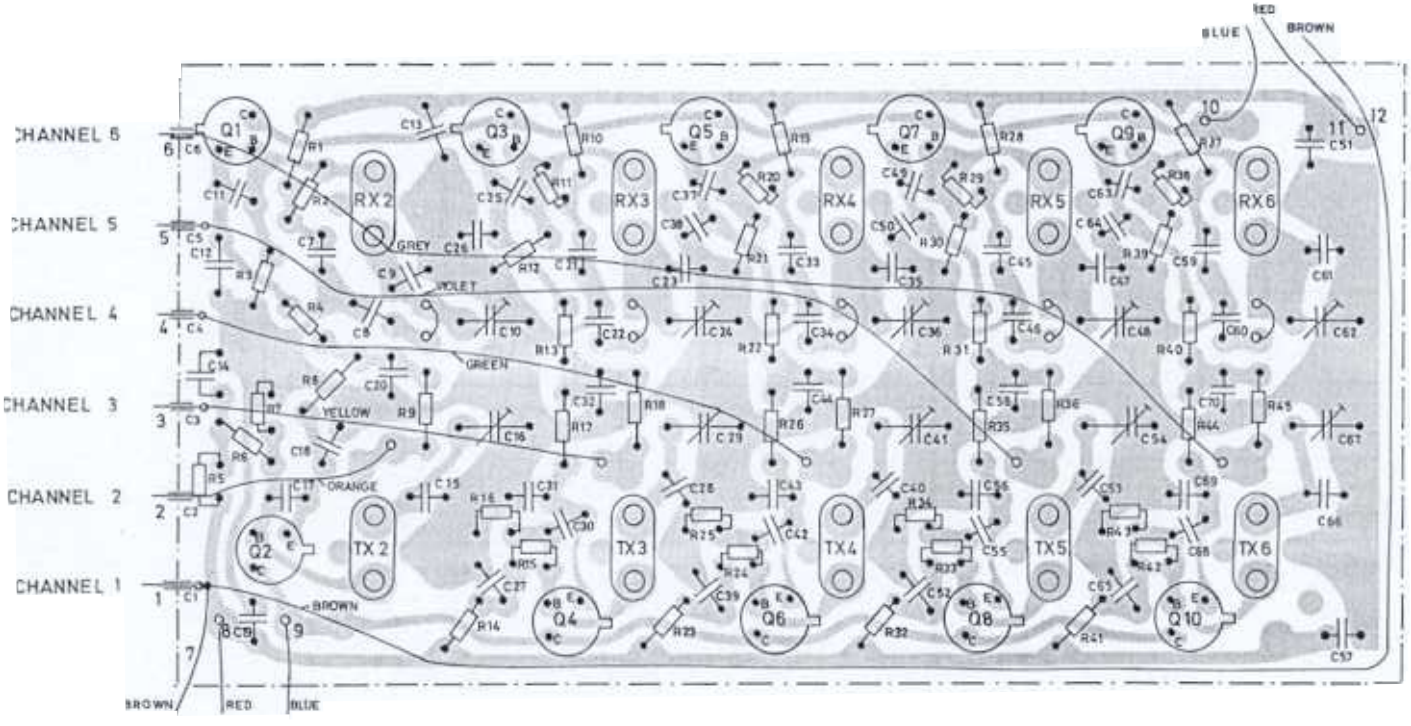




CRYSTAL SWITCH UNIT XS701

D401.328/3

Storno



PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE

CRYSTAL OSCILLATOR PANEL XS701

D401.518

TYPE	NO.	CODE	DATA	
XS701		10.2436	Crystal Switching Unit	
	C1	74.5167	1 nF -20 +80% ceram FT	300V
	C2	74.5167	1 nF -20 +80% ceram FT	300V
	C3	74.5167	1 nF -20 +80% ceram FT	300V
	C4	74.5167	1 nF -20 +80% ceram FT	300V
	C5	74.5167	1 nF -20 +80% ceram FT	300V
	C6	74.5167	1 nF -20 +80% ceram FT	300V
	C7	76.5059	2.2 nF 10% polyest. FL	50V
	C8	74.5135	10 pF 5% ceram DI	125V
	C9	74.5191	33 pF 5% ceram TB	160V
	C10	78.5044	2-18 pF trimmer	300V
	C11	76.5102	100 pF 2.5% polystyr TB	25V
	C12	76.5106	470 pF 2.5% polystyr TB	25V
	C13	76.5071	22 nF 10% polyest. FL	50V
	C14	76.5059	2.2 nF 10% polyest. FL	50V
	C15	74.5192	27 pF 5% ceram TB	160V
	C16	78.5044	2-18 pF trimmer	300V
	C17	76.5104	220 pF 2.5% polystyr TB	25V
	C18	76.5106	470 pF 2.5% polystyr TB	25V
	C19	76.5071	22 nF 10% polyest. FL	50V
	C20	76.5061	4.7 nF 10% polyest. FL	50V
	C21	76.5059	2.2 nF 10% polyest. FL	50V
	C22	74.5135	10 pF 5% ceram DI	125V
	C23	74.5191	33 pF 5% ceram TB	160V
	C24	78.5044	2-18 pF trimmer	300V
	C25	76.5102	100 pF 2.5% polystyr TB	25V
	C26	76.5106	470 pF 2.5% polystyr TB	25V
	C27	76.5059	2.2 nF 10% polyest. FL	50V
	C28	74.5192	27 pF 5% ceram TB	160V
	C29	78.5044	2-18 pF trimmer	300V
	C30	76.5104	220 pF 2.5% polystyr TB	25V
	C31	76.5106	470 pF 2.5% polystyr TB	25V
	C32	76.5061	4.7 nF 10% polyest. FL	50V
	C33	76.5059	2.2 nF 10% polyest. FL	50V
	C34	74.5135	10 pF 5% ceram DI	125V
	C35	74.5191	33 pF 5% ceram TB	160V
	C36	78.5044	2-18 pF trimmer	300V
	C37	76.5102	100 pF 2.5% polystyr TB	25V
	C38	76.5106	470 pF 2.5% polystyr TB	25V
	C39	76.5059	2.2 nF 10% polyest. FL	50V
	C40	74.5192	27 pF 5% ceram TB	160V
	C41	78.5044	2-18 pF trimmer	300V
	C42	76.5104	220 pF 2.5% polystyr TB	25V
	C43	76.5106	470 pF 2.5% polystyr TB	25V
	C44	76.5061	4.7 nF 10% polyest. FL	50V
	C45	76.5059	2.2 nF 10% polyest. FL	50V
	C46	74.5135	10 pF 10% ceram DI	125V

Storno

TYPE	NO.	CODE	DATA	
	C47	74.5191	33 pF 5% ceram TB	160V
	C48	78.5044	2-18 pF trimmer	300V
	C49	76.5102	100 pF 2.5% polystyr TB	25V
	C50	76.5106	470 pF 2.5% polystyr TB	25V
	C51	76.5071	22 nF 10% polyest. FL	50V
	C52	76.5059	2.2 nF 10% polyest. FL	50V
	C53	74.5192	27 pF 5% ceram TB	160V
	C54	78.5044	2-18 pF trimmer	300V
	C55	76.5104	220 pF 2.5% polystyr TB	25V
	C56	76.5106	470 pF 2.5% polystyr TB	25V
	C57	76.5071	22 nF 10% polyest. FL	50V
	C58	76.5061	4.7 nF 10% polyest. FL	50V
	C59	76.5059	2.2 nF 10% polyest. FL	50V
	C60	74.5135	10 pF 5% ceram DI	125V
	C61	74.5191	33 pF 5% ceram TB	160V
	C62	78.5044	2-18 pF trimmer	300V
	C63	76.5102	100 pF 2.5% polystyr TB	25V
	C64	76.5106	470 pF 2.5% polystyr TB	25V
	C65	76.5059	2.2 nF 10% polyest. FL	50V
	C66	74.5192	27 pF 5% ceram TB	160V
	C67	78.5044	2-18 pF trimmer	300V
	C68	76.5104	220 pF 2.5% polystyr TB	25V
	C69	76.5106	470 pF 2.5% polystyr TB	25V
	C70	76.5061	4.7 nF 10% polyest. FL	50V
	R1	80.5243	330 Ω 5% carbon film	1/8W
	R2	80.5265	22 kΩ 5% " "	1/8W
	R3	80.5262	12 kΩ 5% " "	1/8W
	R4	80.5247	680 Ω 5% " "	1/8W
	R5	80.5243	330 Ω 5% " "	1/8W
	R6	80.5265	22 kΩ 5% " "	1/8W
	R7	80.5262	12 kΩ 5% " "	1/8W
	R8	80.5247	680 Ω 5% " "	1/8W
	R9	80.5237	100 Ω 5% " "	1/8W
	R10	80.5243	330 Ω 5% " "	1/8W
	R11	80.5265	22 kΩ 5% " "	1/8W
	R12	80.5262	12 kΩ 5% " "	1/8W
	R13	80.5247	680 Ω 5% " "	1/8W
	R14	80.5243	330 Ω 5% " "	1/8W
	R15	80.5265	22 kΩ 5% " "	1/8W
	R16	80.5262	12 kΩ 5% " "	1/8W
	R17	80.5247	680 Ω 5% " "	1/8W

CRYSTAL SWITCH UNIT XS701

Storno

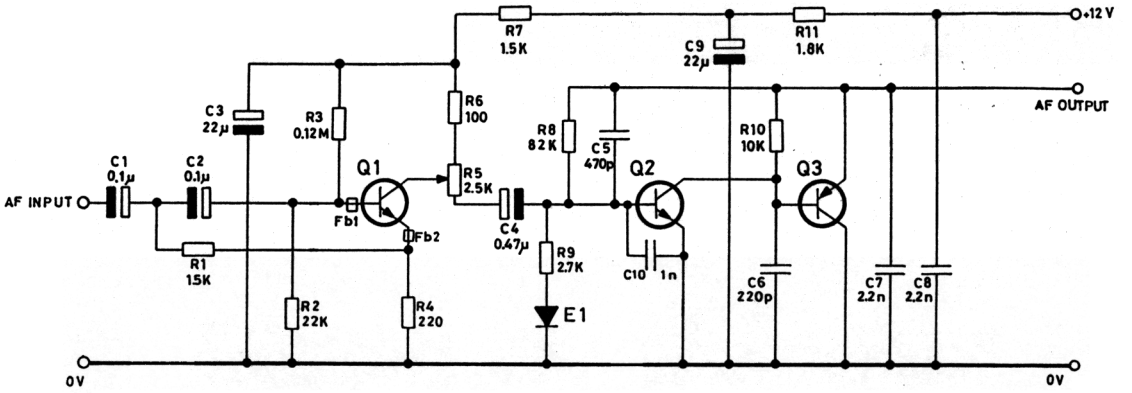
Storno

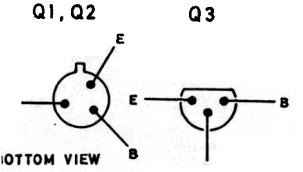
TYPE	NO.	CODE	DATA		TYPE	DATA
	R18	80.5237	100 Ω 5%	carbon film 1/8W		
	R19	80.5243	330 Ω 5%	" " 1/8W		
	R20	80.5265	22 kΩ 5%	" " 1/8W		
	R21	80.5262	12 kΩ 5%	" " 1/8W		
	R22	80.5247	680 Ω 5%	" " 1/8W		
	R23	80.5243	330 Ω 5%	" " 1/8W		
	R24	80.5265	22 kΩ 5%	" 1/8W		
	R25	80.5262	12 kΩ 5%	" 1/8W		
	R26	80.5247	680 Ω 5%	" 1/8W		
	R27	80.5237	100 Ω 5%	" 1/8W		
	R28	80.5243	330 Ω 5%	" 1/8W		
	R29	80.5265	22 kΩ 5%	1/8W		
	R30	80.5262	12 kΩ 5%	1/8W		
	R31	80.5247	680 Ω 5%	1/8W		
	R32	80.5243	330 Ω 5%	1/8W		
	R33	80.5265	22 kΩ 5%	1/8W		
	R34	80.5262	12 kΩ 5%	1/8W		
	R35	80.5247	680 Ω 5%	1/8W		
	R36	80.5237	100 Ω 5%	" 1/8W		
	R37	80.5243	330 Ω 5%	" 1/8W		
	R38	80.5265	22 kΩ 5%	" 1/8W		
	R39	80.5262	12 kΩ 5%	" 1/8W		
	R40	80.5247	680 Ω 5%	1/8W		
	R41	80.5243	330 Ω 5%	1/8W		
	R42	80.5265	22 kΩ 5%	1/8W		
	R43	80.5262	12 kΩ 5%	1/8W		
	R44	80.5247	680 Ω 5%	1/8W		
	R45	80.5237	100 Ω 5%	1/8W		
	Q1	99.5139	BSX19 Transistor			
	Q2	99.5139	BSX19 "			
	Q3	99.5139	BSX19 "			
	Q4	99.5139	BSX19 "			
	Q5	99.5139	BSX19 "			
	Q6	99.5139	BSX19 "			
	Q7	99.5139	BSX19 "			
	Q8	99.5139	BSX19 "			
	Q9	99.5139	BSX19 "			
	Q10	99.5139	BSX19 "			

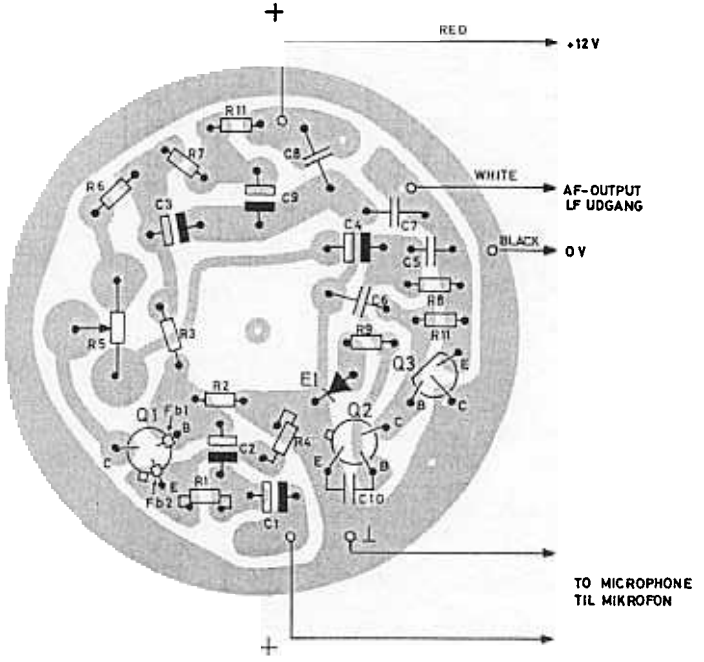
CRYSTAL SWITCH UNIT

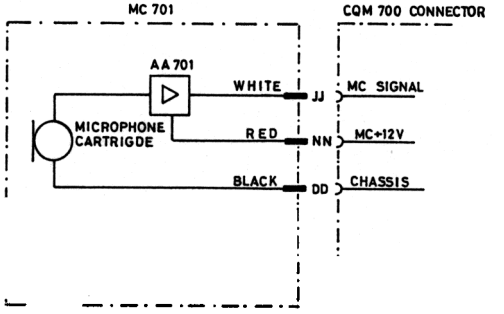
X401.313/2

Storno









PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE.

AF AMPLIFIER
LF FORSTÆRKER AA701

TYPE	NO.	CODE	DATA	
AA701		10.2488	Microphone Amplifier	
	C1	73.5130	0.1 µF -20 +60% tantal	20 V
	C2	73.5130	0.1 µF -20 +60% tantal	20 V
	C3	73.5127	22 µF 20% tantal	16 V
	C4	73.5134	0.47 µF -20 +60% tantal	20 V
	C5	76.5106	470 pF 5% polystyr TB	25 V
	C6	76.5104	220 pF 5% polystyr TB	25 V
	C7	76.5059	2.2 nF 10% polyest. FL	50 V
	C8	76.5059	2.2 nF 10% polyest. FL	50 V
	C9	73.5127	22 µF 20% tantal	16 V
	C10	74.5155	1 nF -20 +80% ceram PL	63 V
	R1	80.5251	1.5 KΩ 5% carbon film	1/8W
	R2	80.5265	22 KΩ 5% carbon film	1/8W
	R3	80.5274	0.12 MΩ 5% carbon film	1/8W
	R4	89.5241	220 Ω 5% carbon film	1/8W
	R5	86.5067	2.5 KΩ 20% potentiometer	0.1W
	R6	80.5237	100 Ω 5% carbon film	1/8W
	R7	80.5251	1.5 KΩ 5% carbon film	1/8W
	R8	80.5272	82 KΩ 5% carbon film	1/8W
	R9	80.5254	2.7 KΩ carbon film	1/8W
	R10	80.5261	10 KΩ 5% carbon film	1/8W
	R11	80.5252	1.8 KΩ carbon film	1/8W
	E1	99.5028	1N914 Diode	
	Q1	99.5121	BC107 Transistor	
	Q2	99.5121	BC107 Transistor	
	Q3	99.5144-02	BC214 L Transistor	
	Fb1	65.5102	Ferrit bead	
	Fb2	65.5102	Ferrit bead	

Storno

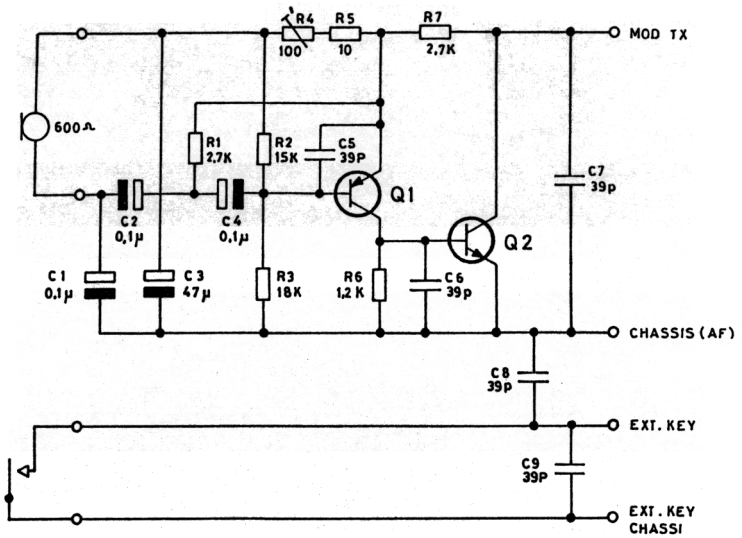
TYPE	NO.	CODE	DATA

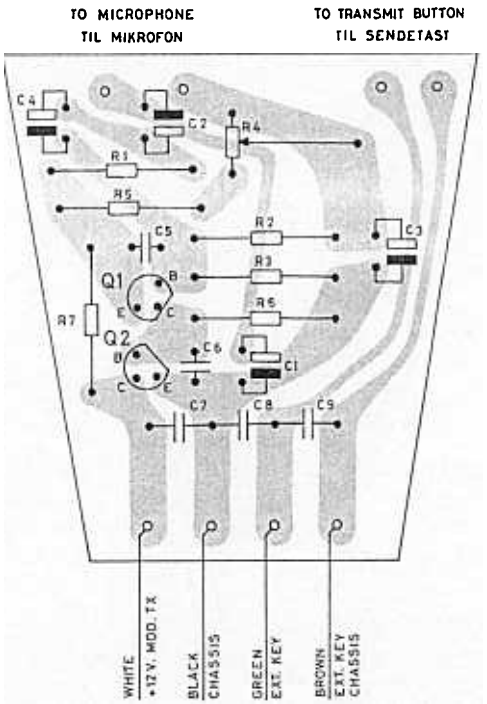
MICROPHONE AMPLIFIER
MIKROFONFORSTÆRKER

AA701

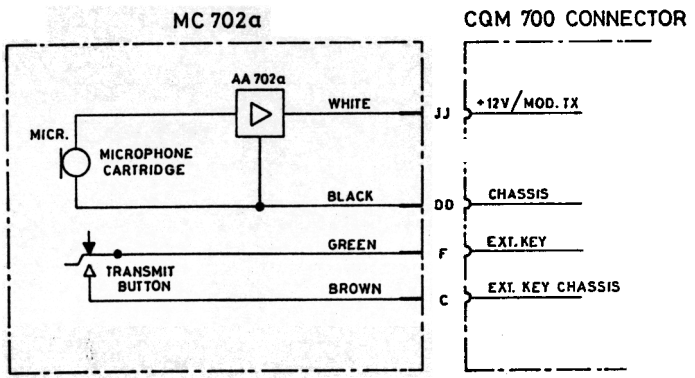
X401.318/3

Storno





PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE.
TRYKT KREDSLØB SET FRA KOMPONENTSIDEN.



MICROPHONE PREAMPLIFIER
MIKROFONFORSTÆRKER

AA702a

D 402.206

TYPE	NO.	CODE	DATA
MC702		96.0094-01	Fist Microphone
		96.5069	Microphone cartridge
		10.2548-01	AA702a Microphone Preamplifier
	O1	47.5040	Switch
AA702a		10.2548-01	Microphone Preamplifier
	C1	73.5089	0.1µF 20% tantal 35V
	C2	73.5089	0.1µF 20% tantal 35V
	C3	73.5124	47µF 20% tantal 6.3V
	C4	73.5089	0.1µF 20% tantal 30V
	C5	74.5137	39pF 10% ceram PL 25V
	C6	74.5137	39pF 10% ceram PL 25V
	C7	74.5137	39pF 10% ceram PL 25V
	C8	74.5137	39pF 10% ceram PL 25V
	C9	74.5137	39pF 10% ceram PL 25V
	R1	80.5254	2.7KΩ 5% carbon film 1/8W
	R2	80.5263	15KΩ 5% " 1/8W
	R3	80.5264	18KΩ 5% " 1/8W
	R4	86.5051	100Ω 20% potentiometer 1/10W
	R5	80.5225	10Ω 5% carbon film 1/8W
	R6	80.5254	2.7KΩ 5% " 1/8W
	R7	80.5254	2.7KΩ 5% " 1/8W
	Q1	99.5144	BC214L Transistor
	Q2	99.5117	2N2924 Transistor

Storno

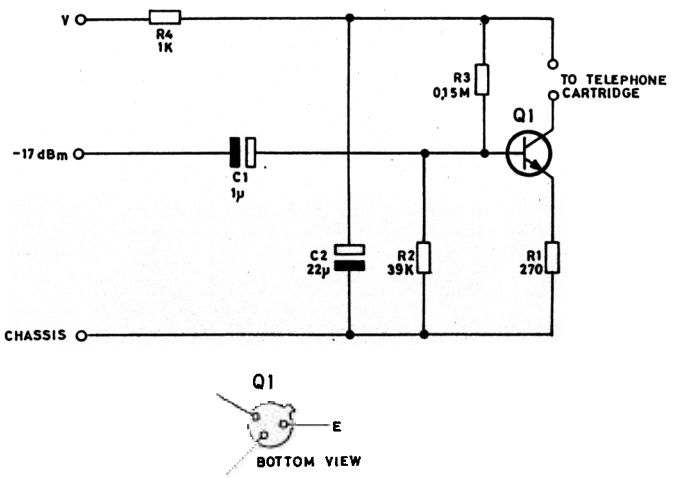
TYPE	NO.	CODE	DATA

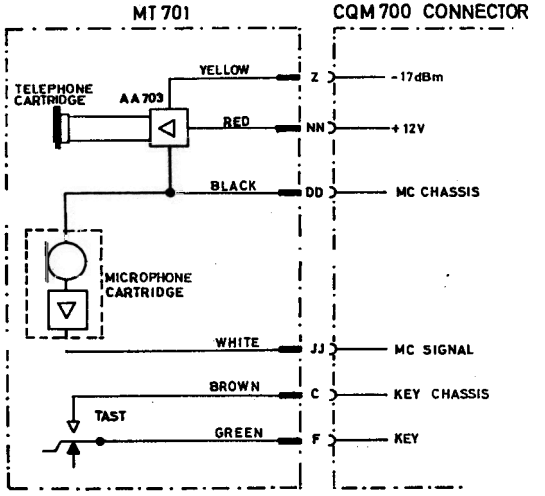
FIST MICROPHONE
HÅNDMIKROFON

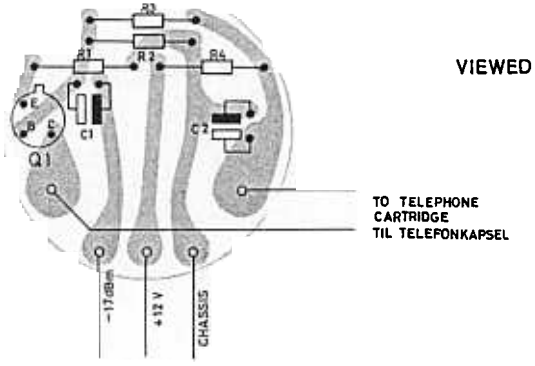
MC702

X401.939

Storno







VIEWED FROM COMPONENT SIDE

HANDSET
MIKROTELEFON

MT701

D401.844

TYPE	NO.	CODE	DATA
MT 701		96.0096	Handset and Retainer HS602a
		96.0097	Handset
		37.0110	Retainer
		10.2809	AA703 Amplifier
		96.5085	Telephone Cartridge 65Ω
		96.5074	Microphone, dynamic 1500Ω
AA 703		10.2809	Amplifier
	C1	73.5114	1µF 20% tantal 35V
	C2	73.5127	22µF 20% tantal 16V
	R1	80.5242	270Ω 5% carbon film 1/8W
	R2	80.5268	39KΩ 5% " 1/8W
	R3	80.5275	150KΩ 5% " 1/8W
	R4	80.5249	1KΩ 5% " 1/8W
	Q1	99.5143	BC108 Transistor

Storno

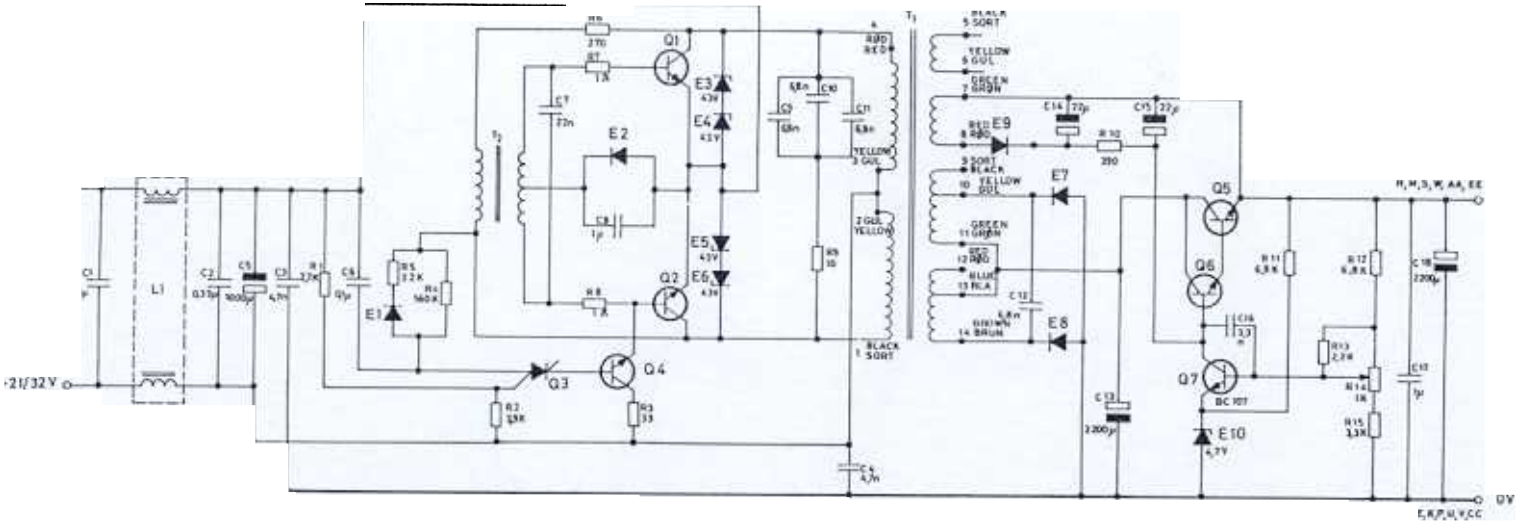
TYPE	NO.	CODE	DATA

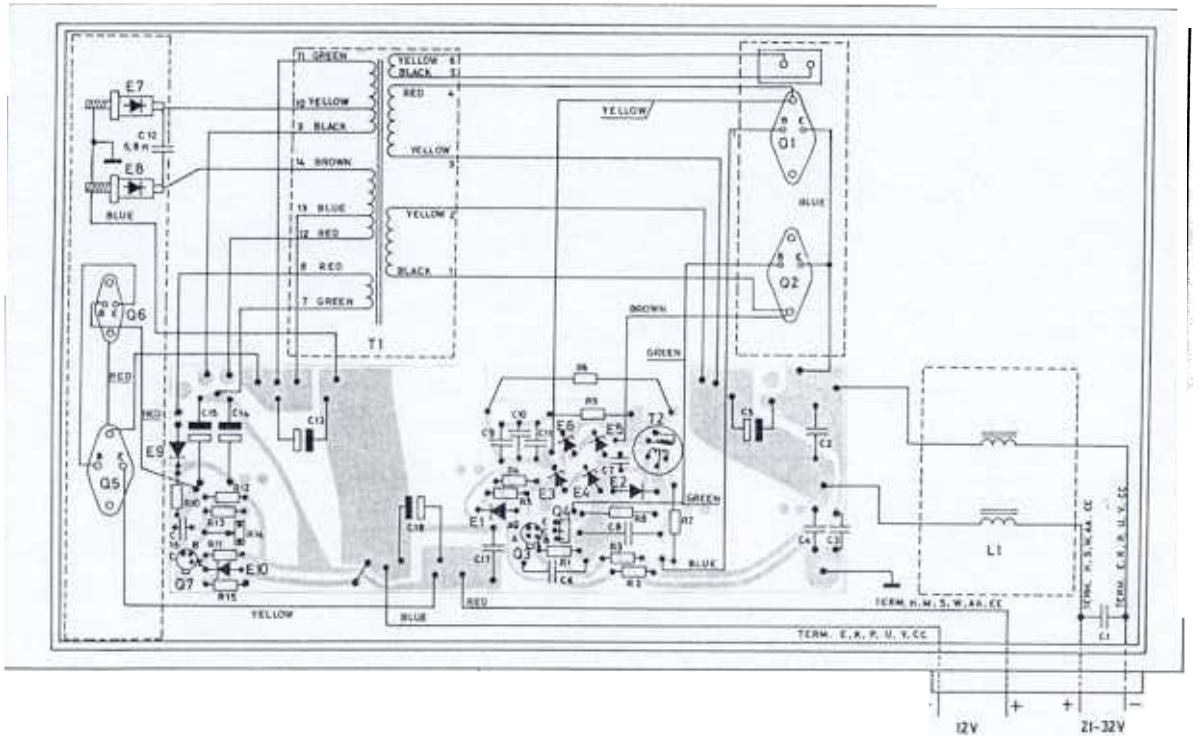
HANDSET
MIKROTELEFON

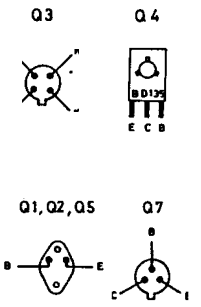
MT701

X401.965

Storno







POWER SUPPLY UNIT
STRØMFORSYNING

PS701

TYPE	NO.	CODE	DATA	
PS701		10.2448-00	Power supply unit	
	C1	76.5078	1µF 10% polyest TB	100V
	C2	76.5075	0.33µF10% polyest TB	100V
	C3	74.5285	4.7nF - 20+80% ceram DI	2000V
	C4	74.5285	4.7nF -20+80% ceram DI	2000V
	C5	73.5146	1000µF -10+100% elco	100V
	C6	76.5073	0.1µF 10% polyest TB	100V
	C7	76.5071	22nF 10% polyest FL	50V
	C8	76.5078	1µF 10% polyest TB	100V
	C9	74.5286	6.8nF 20% ceram DI	400V
	C10	74.5286	6.8nF 20% ceram DI	400V
	C11	74.5286	6.8nF 20% ceram DI	400V
	C12	74.5286	6.8nF 20% ceram DI	400V
	C13	73.5139	2200µF - 10+100% elco	40V
	C14	73.5145	22µF - 10+100% elco	40V
	C15	73.5145	22µF - 10+100 elco	40V
	C16	76.5060	3.3nF 10% polyest	50V
	C17	76.5096	1µF 20% polyest	100V
	C18	73.5139	2200µF - 10+100% elco	40V
	R1	80.5254	2,7kΩ 5% carbon film	1/8W
	R2	80.5256	3.9kΩ 5% carbon film	1/8W
	R3	80.5231	33Ω 5% carbon film	1/8W
	R4	80.5282	056MΩ 5% carbon film	1/8W
	R5	80.5253	2.2kΩ 5% carbon film	1/8W
	R6	84.5225	270Ω wire wound	9W
	R7	82.5201	1Ω 10% wire wound	1W
	R8	82.5201	1Ω 10% wire wound	1W
	R9	84.5019	10Ω 10% wire wound	5.5W
	R10	80.5244	390Ω 5% carbon film	1/8W
	R11	80.5259	6.8kΩ 5% carbon film	1/8W
	R12	80.5259	6.8kΩ 5% carbon film	1/8W
	R13	80.5253	2.2kΩ 5% carbon film	1/8W
	R14	86.5058	1KΩ 20% potentiometer	0.1W
	R15	80.5255	3.3kΩ 5% carbon film	1/8W
	L1	60.5161	Line filter	
	T1	60.5160	Converter transformer 24-12V 175W	
	T2	61.1118	Transformer, saturation	
	E1	99.5237	1N4148 diode	
	E2	99.5020	1N4004 diode	
	E3	99.5262	BZX70C43 zenerdiode	
	E4	99.5262	BZX70C43 zenerdiode	
	E5	99.5262	BZX70C43 zenerdiode	
	E6	99.5262	BZX70C43 zenerdiode	

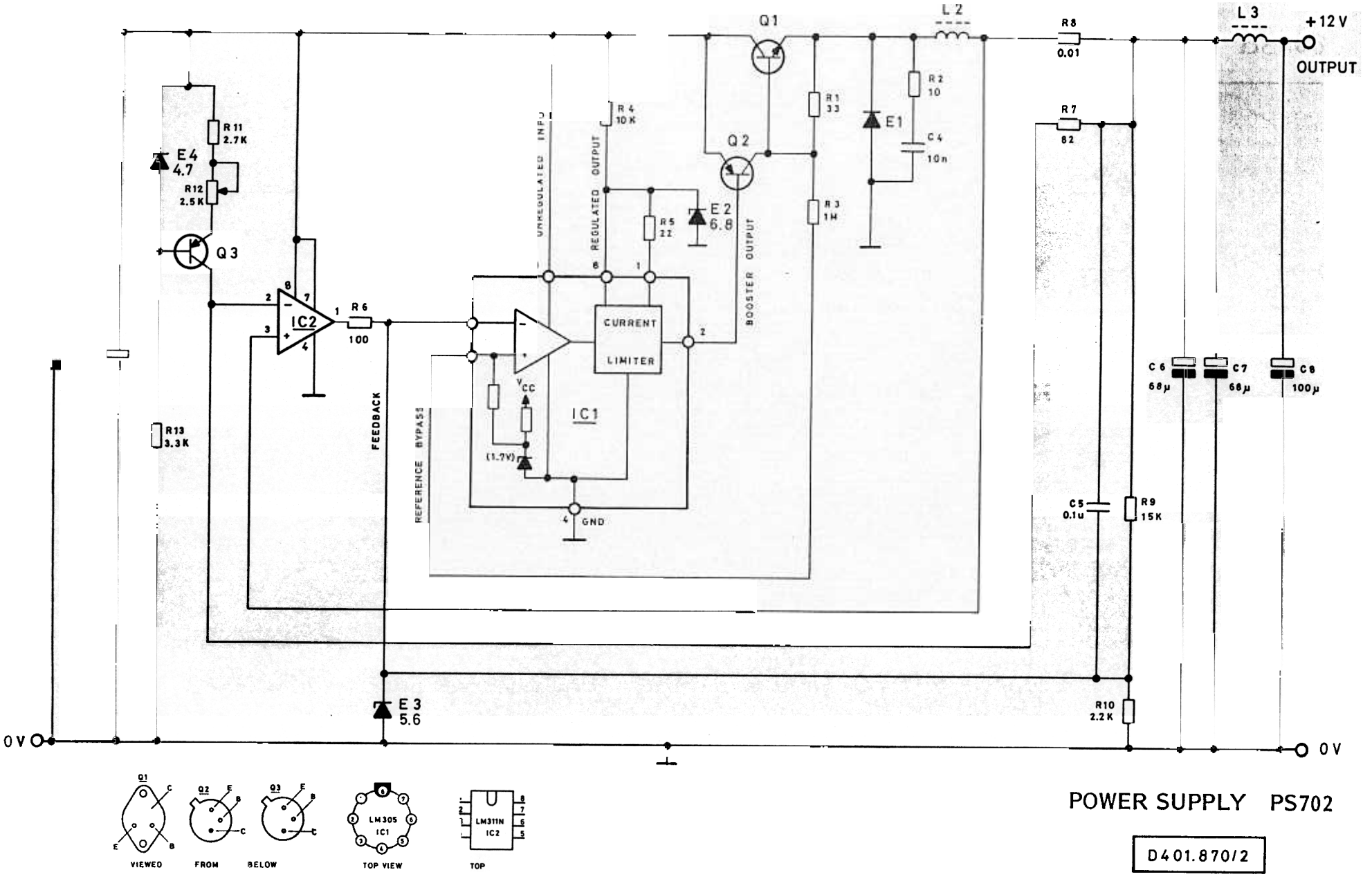
Storno

TYPE	NO.	CODE	DATA
	E7	99.5260	BYX30-200R diode
	E8	99.5260	BY30-200R diode
	E9	99.5020	1N4004 diode
	E10	99.5224	4.7V 5% zenerdiode
	Q1	99.5261	BDY91 Transistor
	Q2	99.5261	BDY91 Transistor
	Q3	99.5238	BRY39 Transistor
	Q4	99.5235	BD135 Transistor
	Q5	99.5261	BDY91 Transistor
	Q6	99.5193	2N3054 Transistor
	Q7	99.5121	BC107 Transistor

POWER SUPPLY UNIT
STRØMFORSYNING

PS701

X 401.789



POWER SUPPLY PS702

D401.870/2

TYPE	NO.	CODE	DATA	
PS702		10.2918	Power Supply	
	C2	73.5071	100µF - 10 + 50% elco	40V
	C3	73.5155	4700µF - 10 + 50% elco	40V
	C4	74.5109	10µF - 20 + 50% ceram FL	63V
	C5	76.5071	0.1µF 20% polyest. FL	50V
	C6	73.5154	68µF 20% elco	16V
	C7	73.5154	68µF 20% elco	16V
	C8	73.5071	100µF - 10 + 50% elco	40V
	R1	80.5231	33Ω 5% carbon film	1/8W
	R2	80.5225	10Ω 5% "	1/8W
	R3	80.5085	1MΩ 5% "	1/10W
	R4	80.5261	10KΩ 5% "	1/8W
	R5	80.5229	22Ω 5% "	1/8W
	R6	80.5237	100Ω 5% "	1/8W
	R7	80.5236	82Ω 5% "	1/8W
	R8	178.5005	0.01Ω constantan wire,	35mm
	R9	80.5263	15KΩ 5% carbon film	1/8W
	R10	80.5253	2.2KΩ 5% "	1/8W
	R11	80.5254	2.7KΩ 5% "	1/8W
	R12	86.5043	2.5KΩ potentiometer	1/10W
	R13	80.5255	3.3KΩ 5% carbon film	1/8W
	L1	61.1235	Filter coil	
	L2	61.1236	Filter coil	
	L3	61.1236	Filter coil	
	E1	99.5289	BYX 5o-200R diode	
	E2	99.5146	6.8V 5% Zener diode	1/4W
	E3	99.5114	5.6V 5% "	1/4W
	E4	99.5224	4.7V 5% "	1/4W
	Q1	99.5261	BDY91 Transistor	
	Q2	99.5215	2N2905A Transistor	
	Q3	99.5251	BC177 Transistor	
	IC1	14.5054	LM305 Voltage regulator	
	IC2	14.5070	LM311N Voltage comparator	

Storno

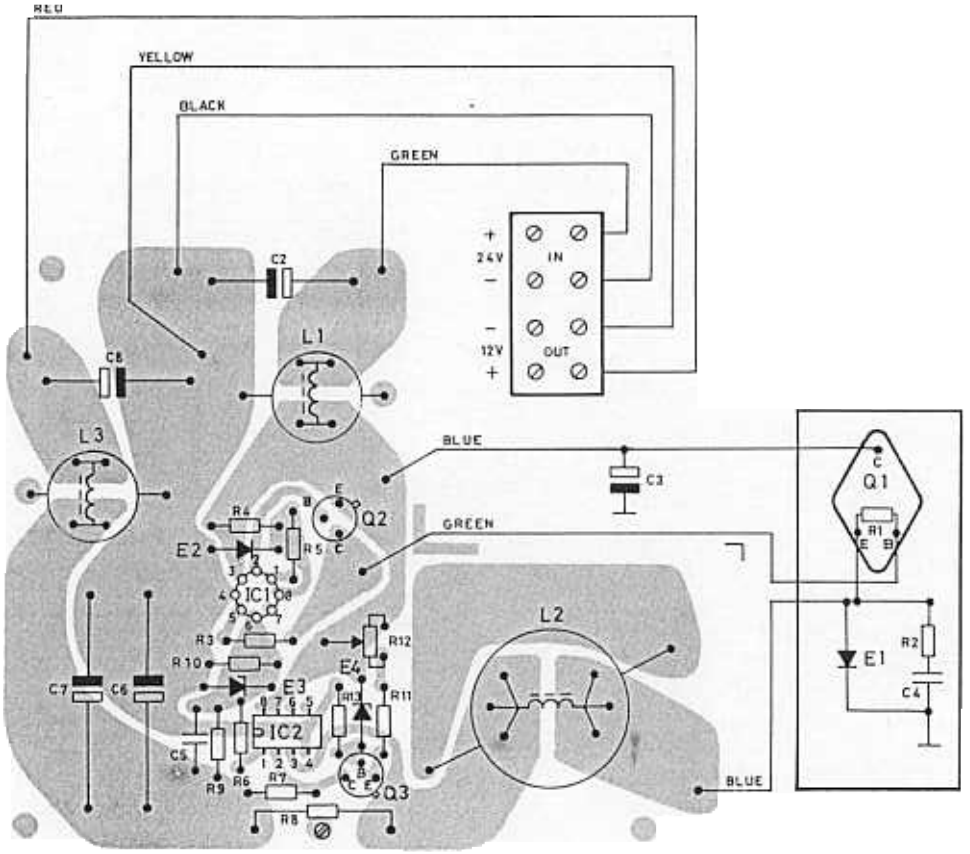
TYPE	NO.	CODE	DATA

POWER SUPPLY
STRØMFORSYNING

PS702

X401.937

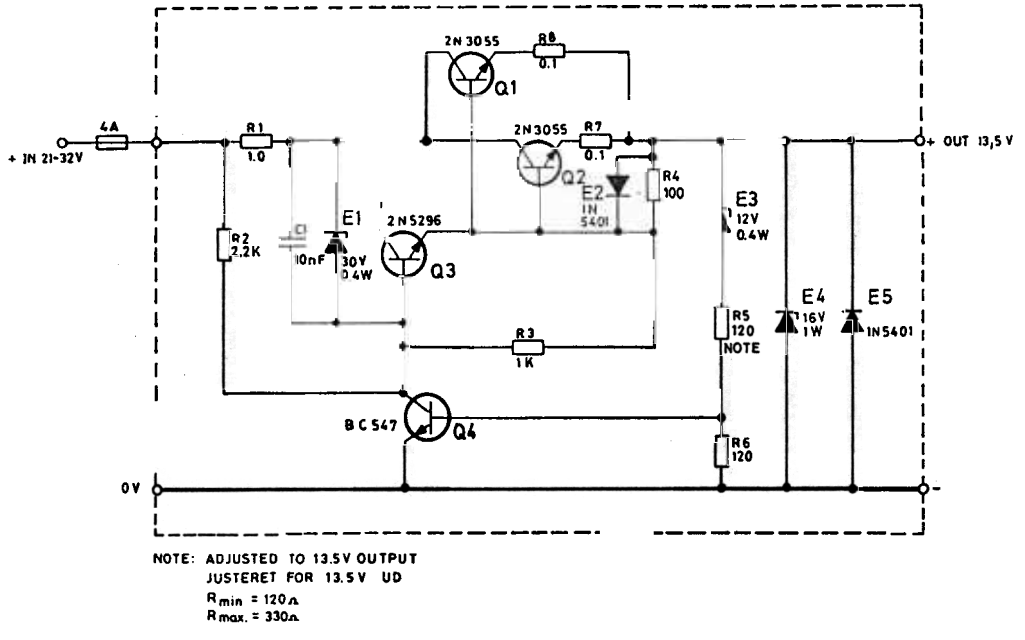
Storno



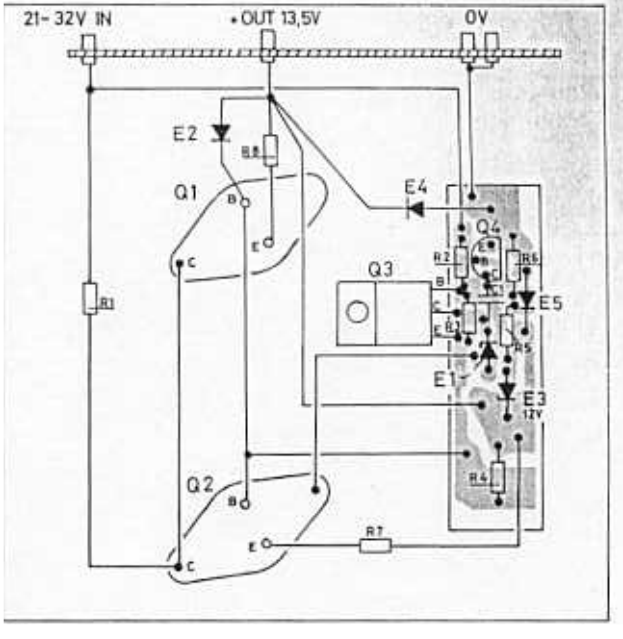
POWER SUPPLY
TRØMFORSYNING

D402.096

Storno



NOTE: ADJUSTED TO 13.5V OUTPUT
JUSTERET FOR 13.5V UD
R_{min} = 120Ω
$R_{max.}$ = 330Ω



Storno

POWER SUPPLY
STRØMFORSYNING

PS704

Storno

TYPE	Nº	CODE	DATA			
PS704		10.3049	Voltageregulator 24 V DC/13.5 V DC			
	C1		10 nF	10%	polyest.	
	R1		1 Ω		Resistance wire	
	R2	80.5453	2.2 KΩ	5%	carbon film	1/4 W
	R3	80.5449	1 KΩ	5%	" "	1/4 W
	R4	80.5437	100 Ω	5%	" "	1/4 W
	R5	80.54XX	120-330 Ω	5%	" "	1/4 W
	R6	80.5438	120 Ω	5%	" "	1/4 W
	R7		0.1 Ω		Resistance wire	
	R8		0.1 Ω		" "	
	E1		30 V		Zenerdiode	0.4 W
	E2	99.5220	1 N 5401		Diode	
	E3		12 V		Zenerdiode	0.4 W
	E4		16 V		Zenerdiode	1 W
	E5	99.5220	1 N 5401		Diode	
	Q1	99.5171	2 N 3055		Transistor	
	Q2	99.5171	2 N 3055		"	
	Q3		2 N 5296		"	
	Q4		BC 547		"	
			Fuse 4 A			

Storno

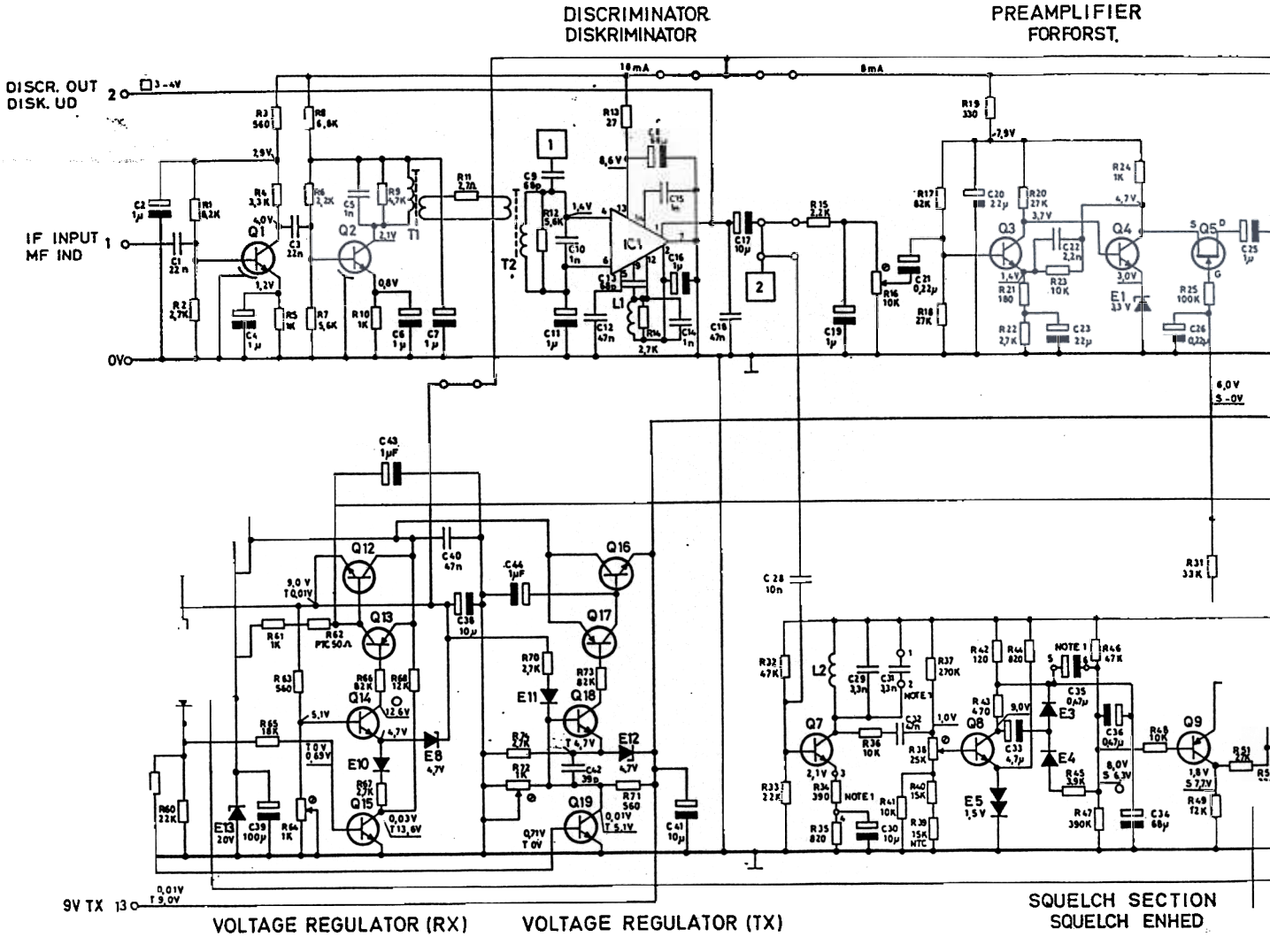
TYPE	Nº	CODE	DATA

POWER SUPPLY UNIT
STRØMFORSYNING

PS704

X402.397

LOWER PRINTED WIRING BOARD



DEPENDING ON THE CHANNEL SEPARATION EMPLOYED
MAKE THE FOLLOWING ALTERATIONS:

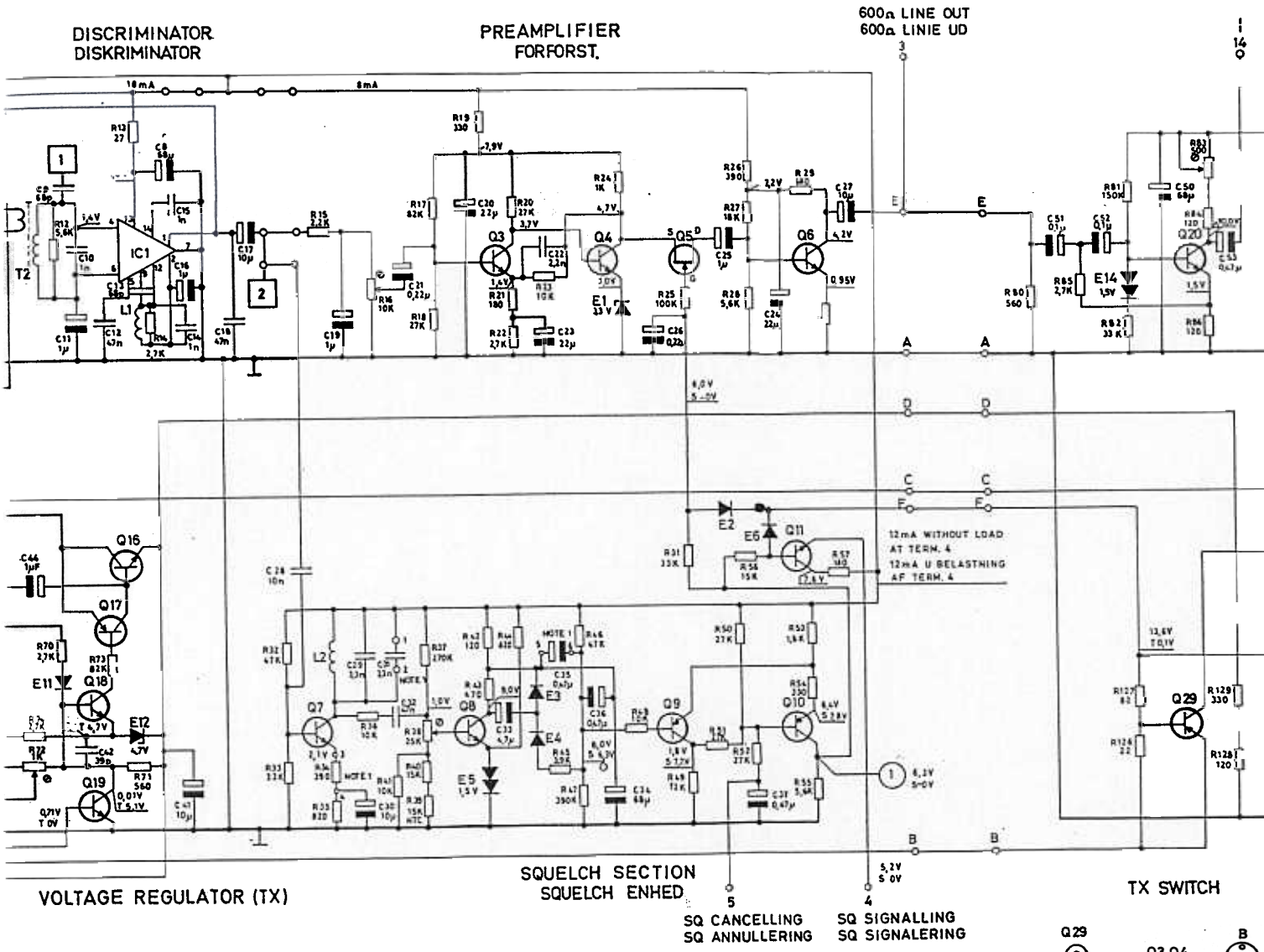
CH. SEP. \ POINTS	1-2	3-4	5-6	
12.5 kHz	3.3nF	150n	0.47µF	REPLACE R119, R120, R121, BY 27Kn
20/25 kHz	3.3nF	390n	0.47µF	
50 kHz	OPEN	820n	OPEN	

CONDITIONS OF MEASUREMENTS

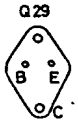
- □ MEASURED AT Δf = 0 kHz
- Δ RESISTOR R83 SHORT-CIRCUITED
- S SQUELCHED CONDITION
- T TRANSMITTER KEYED CONDITION
- O USE A HIGH-RESISTANCE VOLTMETER (2Mn)

R PRINTED WIRING BOARD

UPPER PRINTED WI



Q29



Q3, Q4,
Q6-Q11
Q14, Q15
Q18-Q26

1PLOYED

LACE R119. R120. R121. BY 27KΩ

CONDITIONS OF MEASUREMENTS

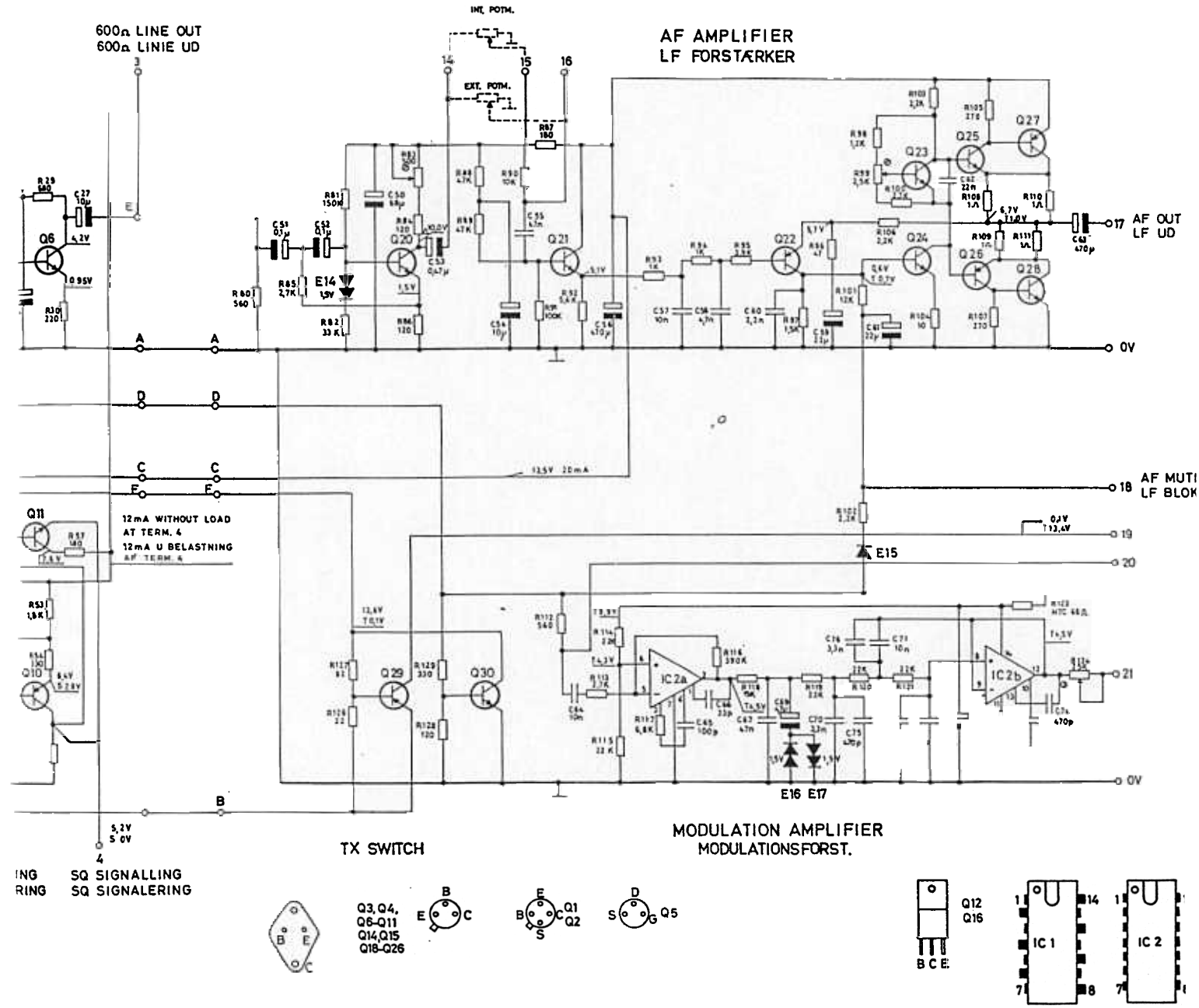
□ MEASURED AT Δf = 0 kHz

Δ RESISTOR R83 SHORT-CIRCUITED

S SQUELCHED CONDITION

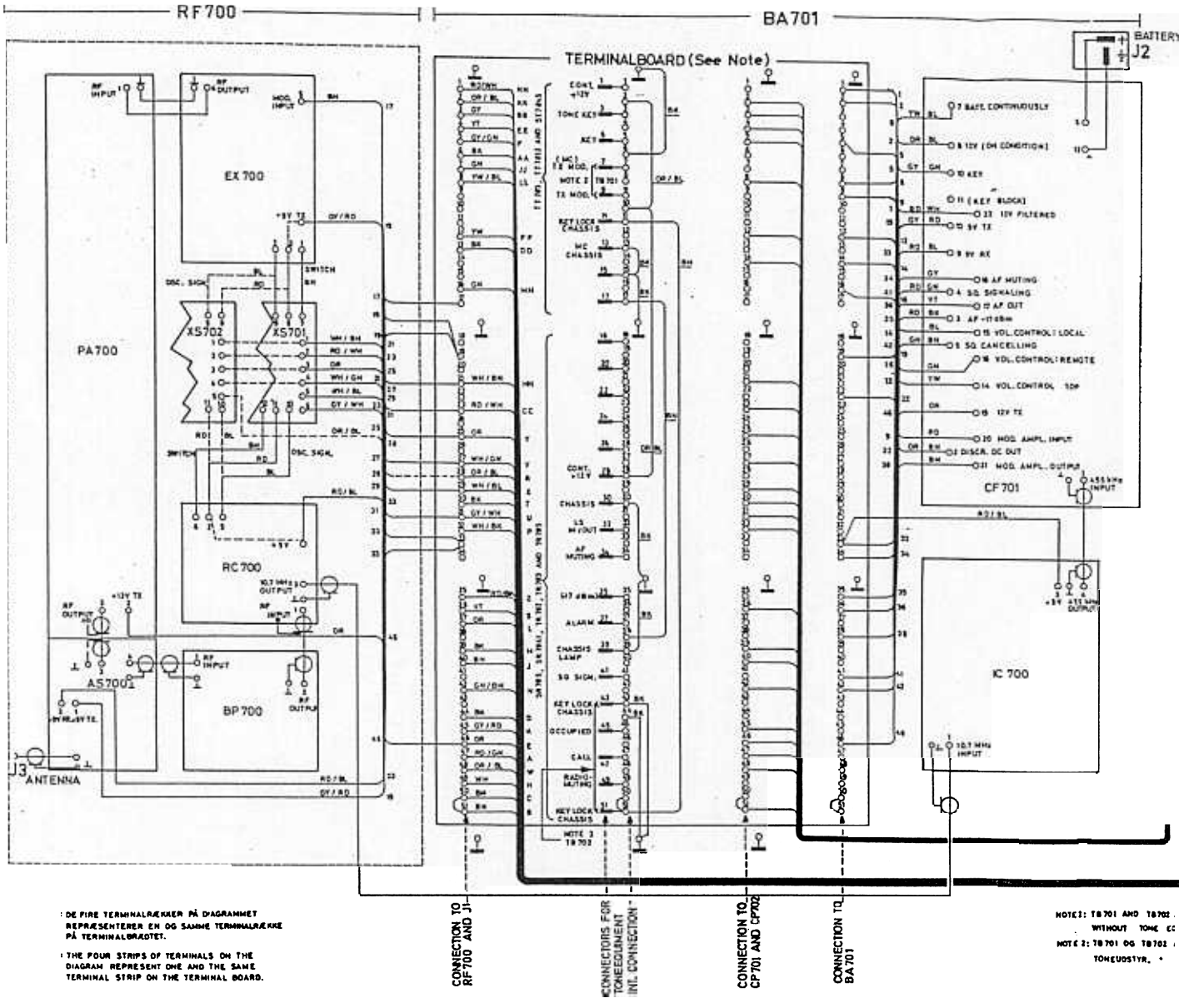
T TRANSMITTER KEYED CONDITION

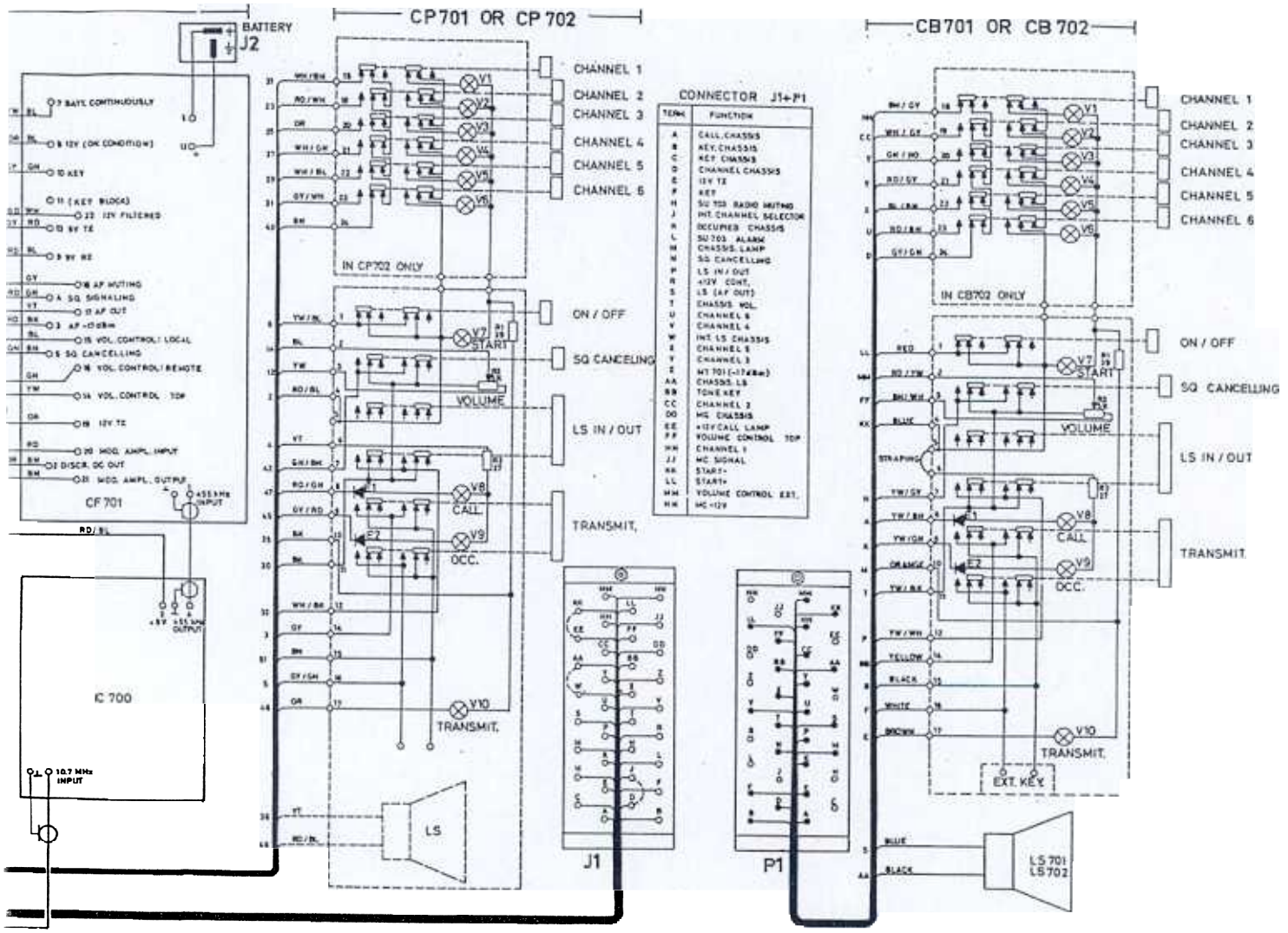
○ USE A HIGH-RESISTANCE VOLTMETER (2MΩ)


600Ω LINE OUT
600Ω LINIE UD
AF AMPLIFIER
LF FORSTÆRKER
INT. POTM.
EXT. POTM.
AF OUT
LF UD
0V
AF MUTI
LF BLOK
12mA WITHOUT LOAD
AT TERM. 4
12mA U BELASTNING
AF TERM. 4
E14
E15
E16 E17
TX SWITCH
MODULATION AMPLIFIER
MODULATIONSFORST.
SQ SIGNALLING
SQ SIGNALERING
Q3, Q4,
Q6-Q11
Q14,Q15
Q18-Q26
Q12
Q16
IC 1
IC 2

D401.

Storno


RF 700
BA 701
TERMINALBOARD (See Note)
BATTERY
J2
EX 700
PA 700
XS702
XS701
RC 700
BP 700
AS 7001
J3
ANTENNA
CF 701
IC 700
DE FIRE TERMINALRÆKKER PÅ DIAGRAMMET REPRÆSENTERER EN OG SAMME TERMINALRÆKKE PÅ TERMINALBRÆDET.
THE FOUR STRIPS OF TERMINALS ON THE DIAGRAM REPRESENT ONE AND THE SAME TERMINAL STRIP ON THE TERMINAL BOARD.
CONNECTION TO RF700 AND J1
CONNECTORS FOR TONEEQUIPMENT INT. CONNECTION
CONNECTION TO CP701 AND CP702
CONNECTION TO BA701



NOTE 1: TB701 AND TB702 ARE INSERTED IN RADIOTELEPHONES WITHOUT TONE EQUIPMENT.

NOTE 2: TB701 OG TB702 ANVENDES KUN I RADIOTELEFON UDEN TONEUDSTYR.

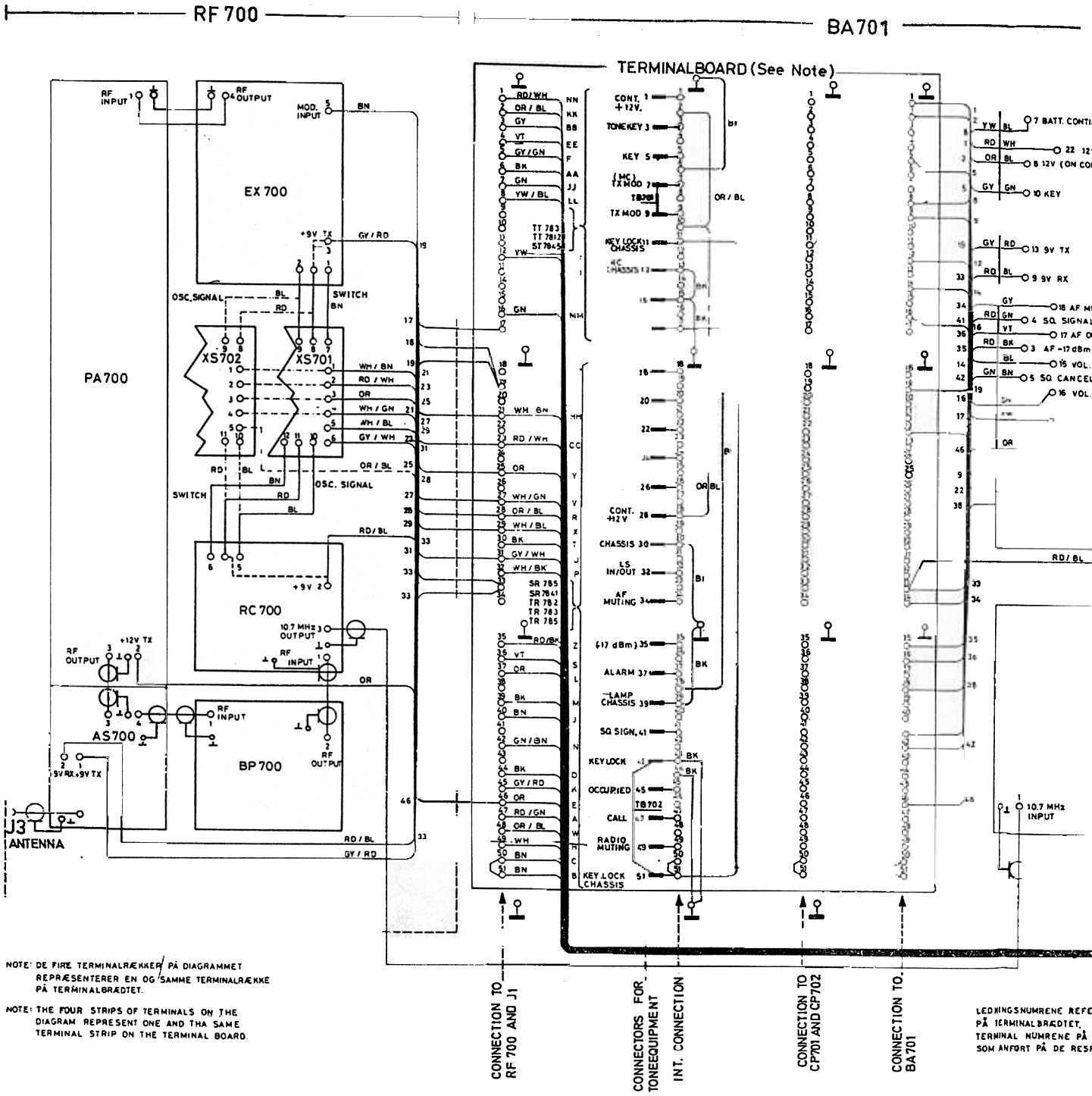
NUMBERS USED IN CABLING REFER TO NUMBERS ON THE TERMINALBOARD. TERMINAL NUMBERS OF UNITS CONFORM TO THE TERMINAL NUMBERS USED ON THE DIAGRAM OF THE VARIOUS UNITS.

LEDNINGSNUMRENE REFFERERER TIL NUMRENE PA TERMINALBRÆDTET. TERMINALNUMRENE PÅ ENHEDERNE ER DE SAMME SOM ANFØRT PÅ DE RESPEKTIVE DIAGRAMMER.

CABLING
LOCAL/EXTENDED LOCAL CONTROLLED CQM700
LOKAL/FJERNBETJENT CQM700

D401.581

Storno

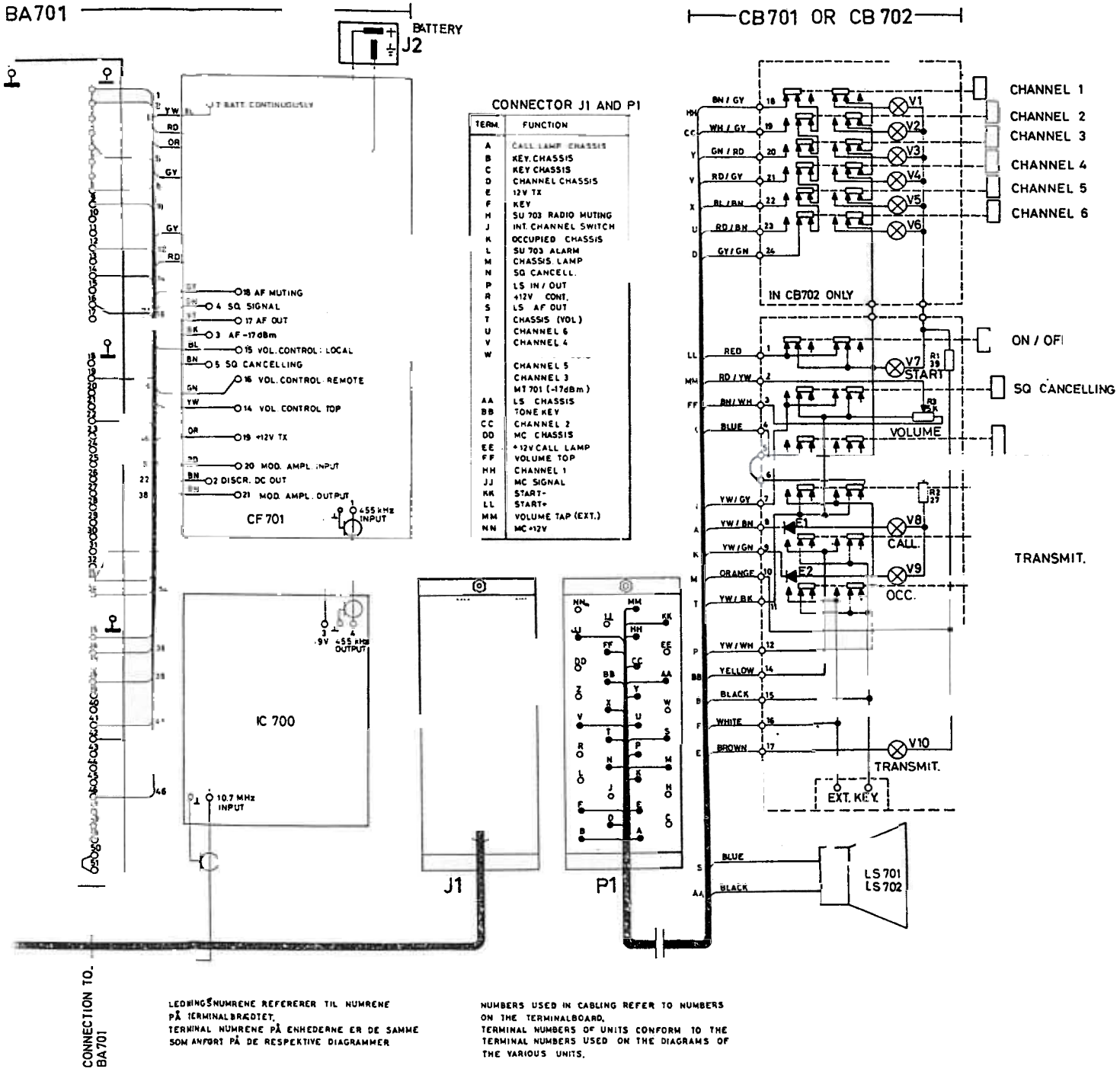


NOTE: DE FIRE TERMINALRÆKKER PÅ DIAGRAMMET REPRÆSENTERER EN OG SAMME TERMINALRÆKKE PÅ TERMINALBRÆDTET.

NOTE: THE FOUR STRIPS OF TERMINALS ON THE DIAGRAM REPRESENT ONE AND THA SAME TERMINAL STRIP ON THE TERMINAL BOARD.

LEDNINGSNUMRENE REFE
PÅ TERMINALBRÆDTET,
TERMINAL NUMRENE PÅ
SOM ANFØRT PÅ DE RES

Storno



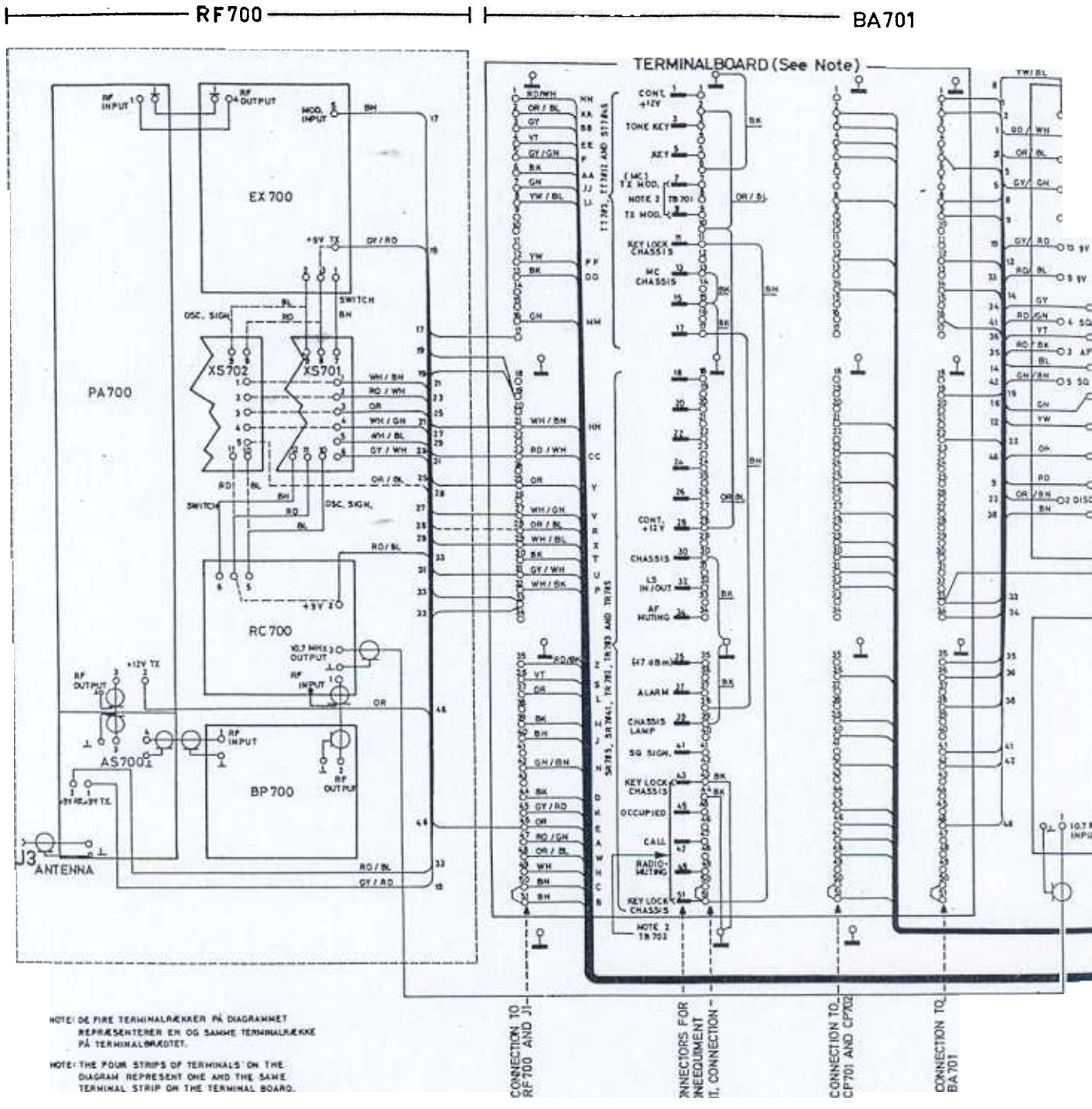
LEDNINGSNUMRENE REFERERER TIL NUMRENE PÅ TERMINALBRÆDTET. TERMINAL NUMRENE PÅ ENHEDERNE ER DE SAMME SOM ANFØRT PÅ DE RESPEKTIVE DIAGRAMMER

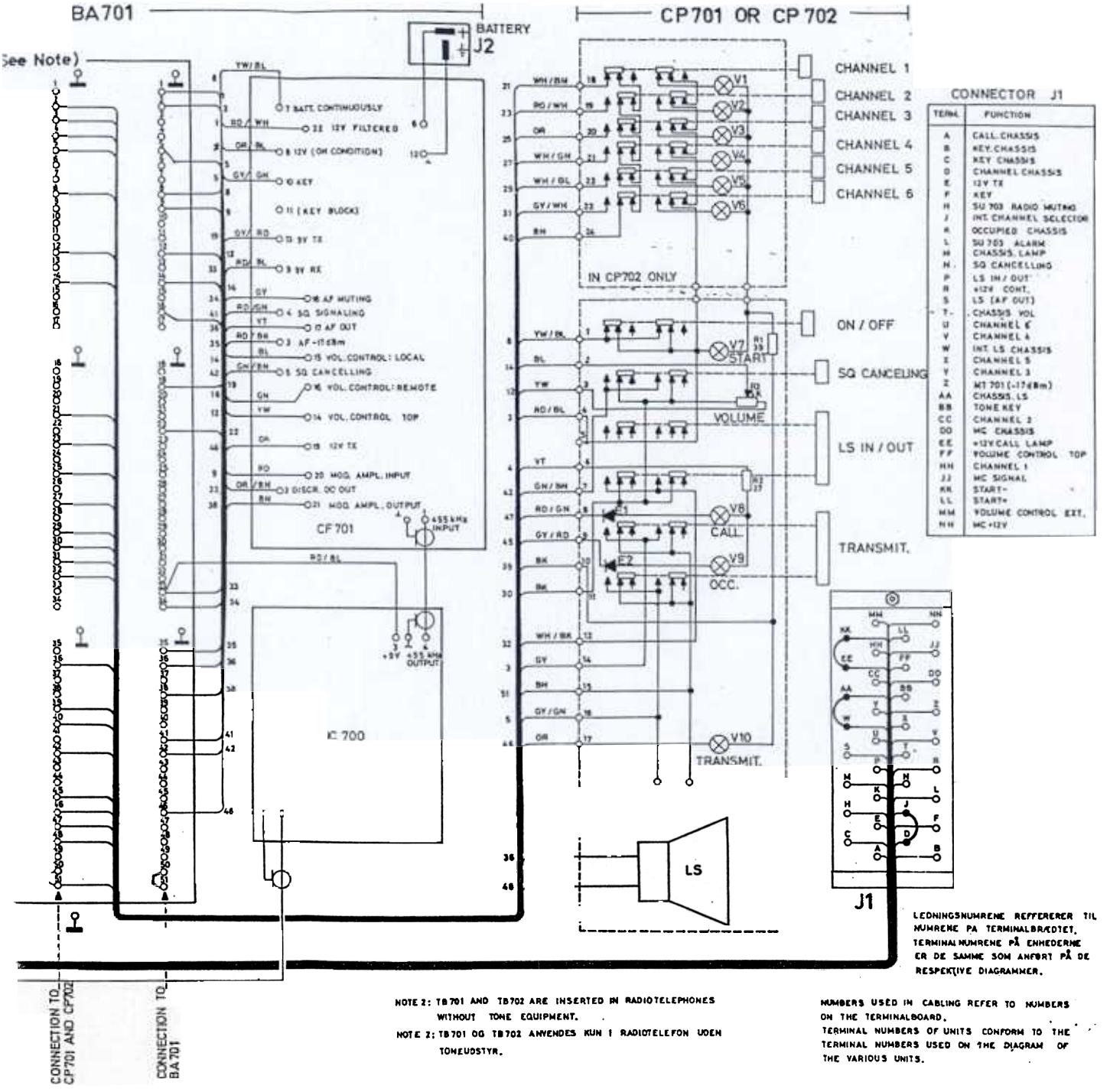
NUMBERS USED IN CABLING REFER TO NUMBERS ON THE TERMINALBOARD. TERMINAL NUMBERS OF UNITS CONFORM TO THE TERMINAL NUMBERS USED ON THE DIAGRAMS OF THE VARIOUS UNITS.

CABLING
EXTENDED LOCAL CONTROLLED CQM
FJERNBETJENT CQM700

D401.580

Storno


RF700
BA701
TERMINALBOARD (See Note)
EX700
PA700
RC700
BP700
AS700
XS702
XS701
SWITCH
ANTENNA
CONNECTION TO RF700 AND J1
CONNECTION TO CP701 AND CP702
CONNECTION TO BA701
NOTE: DE FIRE TERMINALRÆKKER PÅ DIAGRAMMET REPRÆSENTERER EN OG SAMME TERMINALRÆKKE PÅ TERMINALBRÆDTET.
NOTE: THE FOUR STRIPS OF TERMINALS ON THE DIAGRAM REPRESENT ONE AND THE SAME TERMINAL STRIP ON THE TERMINAL BOARD.



TERM.	FUNCTION
A	CALL CHASSIS
B	KEY CHASSIS
C	KEY CHASSIS
D	CHANNEL CHASSIS
E	12 V TX
F	KEY
H	SU 703 RADIO MUTING
J	INT. CHANNEL SELECTOR
K	OCCUPIED CHASSIS
L	SU 703 ALARM
M	CHASSIS LAMP
N	SQ CANCELLING
P	LS IN / OUT
R	+12 V CONT.
S	LS (AF OUT)
T	CHASSIS VOL
U	CHANNEL 6
V	CHANNEL 4
W	INT. LS CHASSIS
X	CHANNEL 5
Y	CHANNEL 3
Z	MT 701 (-17 dBm)
AA	CHASSIS LS
BB	TONE KEY
CC	CHANNEL 2
DD	MC CHASSIS
EE	+12 V CALL LAMP
FF	VOLUME CONTROL TOP
HH	CHANNEL 1
JJ	MC SIGNAL
KK	START-
LL	START+
MM	VOLUME CONTROL EXT.
NN	MC +12 V

LEDNINGSNUMRENE REFFERERER TIL NUMRENE PA TERMINALBRÆDTET. TERMINALNUMRENE PÅ ENHEDERNE ER DE SAMME SOM ANFØRT PÅ DE RESPEKTIVE DIAGRAMMER.

NOTE 2: TB701 AND TB702 ARE INSERTED IN RADIOTELEPHONES WITHOUT TONE EQUIPMENT.

NOTE 2: TB701 OG TB702 ANVENDES KUN I RADIOTELEFON UDEN TONEUDSTYR.

NUMBERS USED IN CABLING REFER TO NUMBERS ON THE TERMINALBOARD. TERMINAL NUMBERS OF UNITS CONFORM TO THE TERMINAL NUMBERS USED ON THE DIAGRAM OF THE VARIOUS UNITS.

CABLING
LOCAL CONTROLLED
LOKAL BETJENT