STORNOPHONE 800U
PERSONAL RADIOTELEPHONE
TYPE CQP863U
420 - 470MHz

Contents

Service Coordination
3-79
2nd Edition

CQP860U

TECHNICAL SPECIFICATIONS

Specifications are based on the measuring methods prescribed in EIA publications RS152A, GPO specification W6771, and CEPT specifications. Figures given in backets are guaranteed values.

GENERAL

Frequency Range
420 -470 MHz

Channel Separation

20/25 kHz

Max Frequency Deviation

± 4 kHz or ± 5kHz

Modulation Frequency Range
300 - 3000Hz

UHF Bandwidth
2.0 MHz

Number of Channels
2, 4, 8, or 12 channels

Antenna Impedance
Multiwire connector: 50 Ω

Temperature Range

Operating range: - 25°C to + 55°C
Functionning range: - 30°C to + 60°C

TRANSMITTER

RF Power Output
Measured at V_b = 11V (BU806-BU807) and 25°C
Degradation under extreme conditions according to CEPT.

1W: 0.1 - 1.0W ± 1dB
3W: 1.0 -3.0 W ± 1dB

Crystal Frequency Range
52.5 MHz to 58.75MHz

Crystal Frequency Calculation

$$f_x = \frac{f_{ant}}{8}$$

Frequency Stability
Conforms with the Authorities' specification.

Spurious Radiation, CEPT
Less than 0.2 μ W

Side Band Noise, CEPT

-75dB (-70dB)

Tone Input Modulation Sensitivity

terminal voltage for 0.6 xΔf_{max}; 1kHz

110mV

Modulation Frequency Characteristic, CEPT

relative to 1000Hz; 6dB/octave

+ 0/ -2,5dB (+1/-3dB) 300-3000Hz

Modulation Distortion, CEPT

measured with de-emphasis 750µS

2% (10%)

FM Hum and Noise, CEPT

-50dB (-40dB)

RECEIVER

Sensitivity, EIA

e. m. f. for 12dB SINAD

0.6µV at 25°C (1µV)

Sensitivity, CEPT

e.m.f. for 20dB S/N

0.7µV at 25°C (1.2µV)

Squelch Sensitivity, EIA

0.5µV at 25°C (1µV)

Crystal Frequency Range

132.866 MHz to 149.533 MHz

Crystal Frequency Calculation

$\frac{f_{ant} - 21.4}{3}$ MHz

Frequency stability

Conforms with Authorities' Specifications

Modulation Pass Band EIA

measured at 25°C

± 7kHz (± 5kHz)

Adjacent Channel Selectivity, EIA

measured at 25°C

85dB (80dB)

Adjacent Channel Selectivity, CEPT

65dB (60dB)

Spurious Selectivity, CEPT

70dB (65dB)

Intermodulation Attenuation, CEPT

75dB (70dB)

Blocking, (GPO

100mV (90mV)

Spurious Radiation, CEPT

Less than 2nW

AF Output Power

500mW (400mW)

Measuring conditions: R_L = 25Ω; distortion 10%; 1kHz; V_B = 11V

AF Output Power, CEPT

250mW (200mW)

($\Delta f = 0.7 \times \Delta f_{max.}$; 1 kHz; distorsion <10%)

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AF Distortion

2% (7%)

(measured at $\Delta f = \frac{2}{3} \Delta f_{max}$; 1kHz; 300mW; 25°C)

AF Frequency Characteristic, CEPT

relative to 1000Hz; -6dB/ octave
+0dB/ -1.5dB/ (+1dB/-3dB)

SUPPLY VOLTAGE AND CURRENT DRAIN

Nominal Supply Voltage

11V

Supply Voltage Range

9.9 to 13.5V

Transmitter Current Drain

(less tone equipment at nominal supply)

1W: 380mA (420mA)
3W: 750mA (800mA)

Receiver Current Drain

(less tone equipment at nominal supply)

Standby: 8.5mA (9.5mA)
Receive, AF output 250mW: 65mA (80mA)

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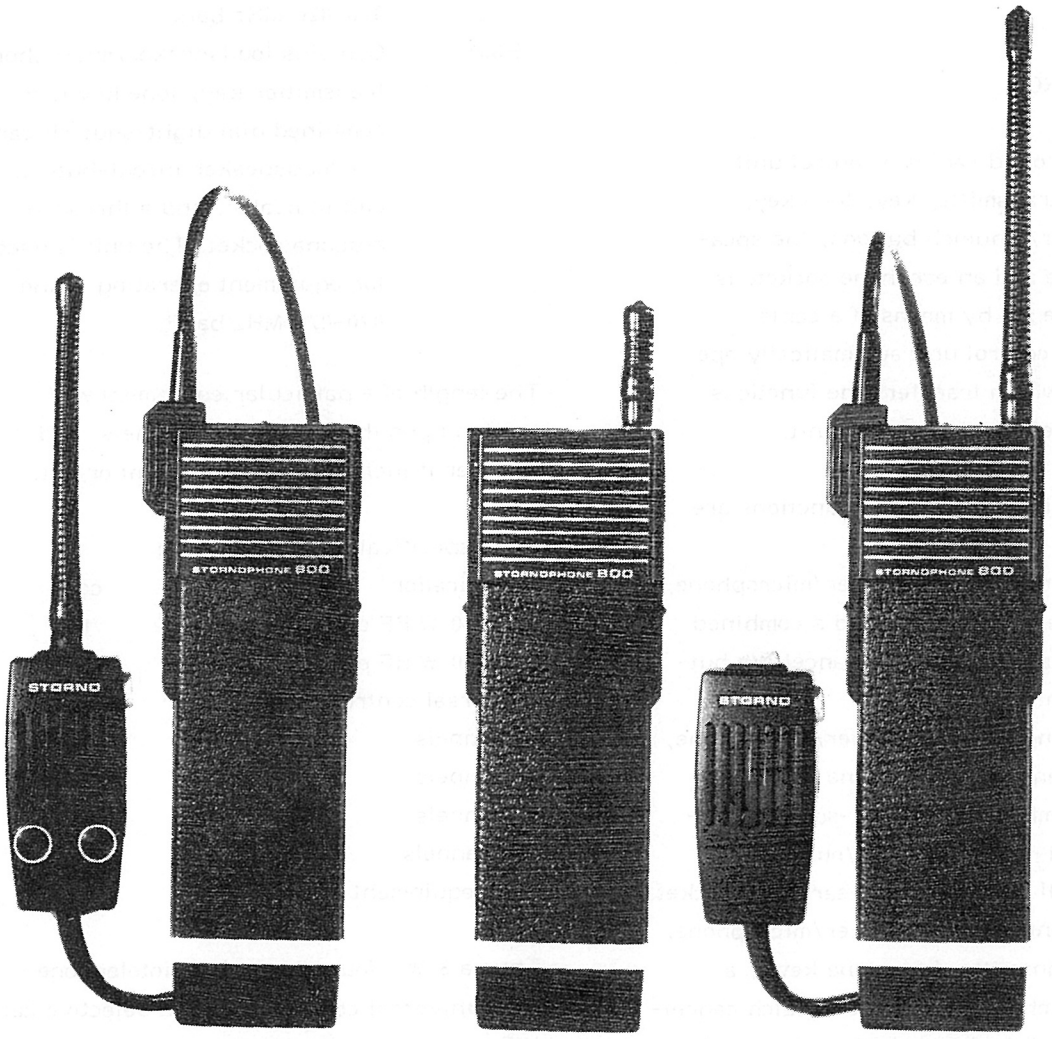
GENERAL DESCRIPTION AND OPERATING INSTRUCTIONS.

STORNOPHONE 800U



The STORNOPHONE 800U portable radiotelephone is a universal combination transmitter and receiver for FM radio communication service on fixed, crystal controlled frequencies.

The CQP800U may be either local controlled or remote controlled, and can be fitted with 2, 4, 8, or 12 channels plus optional tone signalling equipment, according to individual customer requirements.

A complete radiotelephone unit consists of four sections, beginning from the bottom these are:

1) the battery
2) the transmitter and receiver modules
3) the tone equipment
4) the control head

LOCAL CONTROL

Local controlled sets have all of their operating controls as well as the speaker/microphone and the antenna connector placed in the control head, itself, and is fastened to the top of the radiotelephone.

REMOTE CONTROL

On remote controlled radios a control unit containing the transmitter key, tone key, and loudspeaker/ squelch buttons, the speaker/microphone and an earphone socket, is connected to the set by means of a cable. Connecting the control unit automatically operates a switch which transfers the functions of the control head to the control unit.

Control units with the following functions are available:

CB804 Contains loudspeaker/microphone, transmitter key, and a combined dial light-squelch cancelling button.

CB805 Contains loudspeaker/microphone, transmitter key, tone key I, a combined dial light-squelch cancel-loudspeaker in/out button, call indicator, and earphone socket.

CB812 Contains loudspeaker/microphone, transmitter key, tone key I, a combined dial light-squelch cancel-loudspeaker in/out-button, call indicator, and a threaded antenna socket. The unit is used for equipment operating in the 146-174 MHz band.

CB831 Contains loudspeaker/microphone, transmitter key, tone key I, a combined dial light-squelch cancel-loudspeaker in/out-button, call indicator, and a threaded antenna socket. The unit is used for equipment operating in the 68-88 MHz band.

CB851 Contains loudspeaker/microphone, transmitter key, tone key I, a combined dial light-squelch cancel-loudspeaker in/out-button, call indicator, and a threaded antenna socket. The unit is used for equipment operating in the 370-420 MHz band.

CB861 Contains loudspeaker/microphone, transmitter key, tone key I, a combined dial dight-squelch cancel-loudspeaker in/out-button, call indicator, and a threaded antenna socket. The unit is used for equipment operating in the 420-470 MHz band.

The length of a particular equipment will depend upon the number of channels, and whether it includes tone equipment or not.

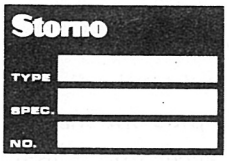
Type specification is as follows:

Specification	code
0.1-1.0 W RF output power	1
1.0-3.0 W RF output power	3
Universal control head CP808	C8
2 channels	X2
4 channels	X4
8 channels	X8
12 channels	X12
Tone equipment	T

Thus a 3 W , four-channel radiotelephone with universal control head and selective calling would be designated:

3 C8 X4T

For easy identification, each equipment has a type plate such as the one pictured below, showing the type and specification.



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

Type	CQP833U	CQP834U
4 m VHF band	68 - 88 MHz	
Channel separation	20/25 kHz	12.5 kHz
Number of channels	2, 4, 8 or 12	
Output power	0.1 to 1.0 W or 1.0 to 3.0 W	

Type	CQP813U	CQP814U
2 m VHF band	146 - 174 MHz	
Channel separation	20/25 kHz	12.5 kHz
Number of channels	2, 4, 8 or 12	
Output power	0.1 to 1.0 W or 1.0 to 3.0 W	

Type	CQP863U	CQP864U	CQP853U	CQP854U
0.7 m UHF band	420 - 470 MHz		370 - 420 MHz	
Channel separation	20/25 kHz	12.5 kHz	20/25 kHz	12.5 kHz
Number of channels	2, 4, 8 or 12		2, 4, 8 or 12	
Output power	0.1 to 1 W or 1 to 3 W		0.1 to 1 W	

Type	CQP8414U
Midband	RX 136 - 146 MHz TX 105 - 108 MHz
Channel separation	12.5 kHz
Number of channels	2, 4, 8 or 12
Output power	0.1 to 1 W

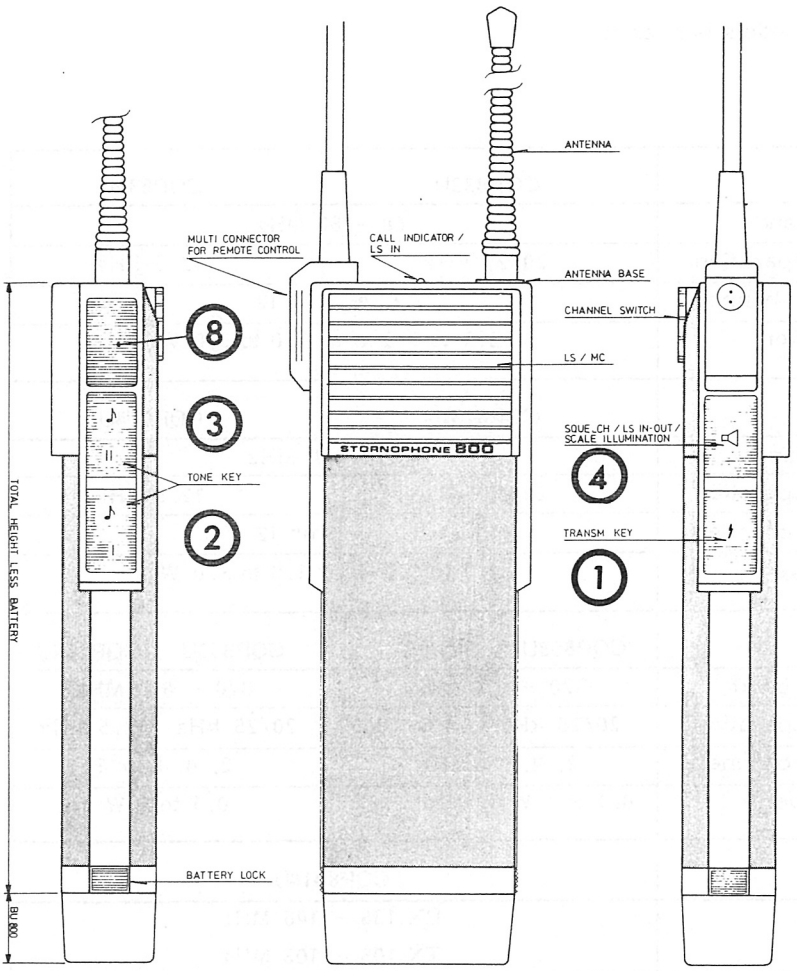
OPERATING INSTRUCTIONS

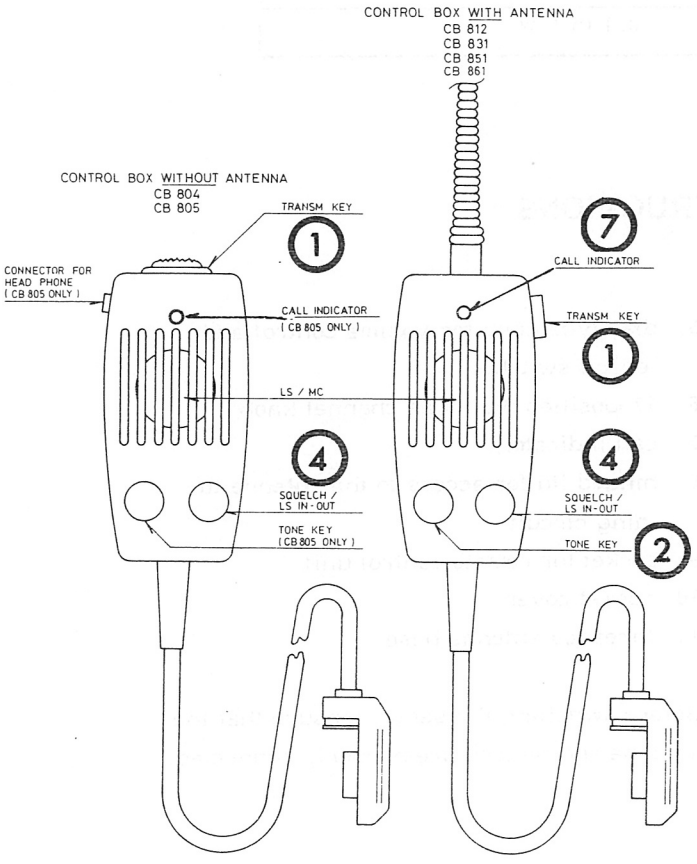
Local controlled equipments are fitted with CP808 control heads which interconnect with the various transmitter and receiver modules, channel switch and tone equipment, where applicable, via an internal wiring harness.

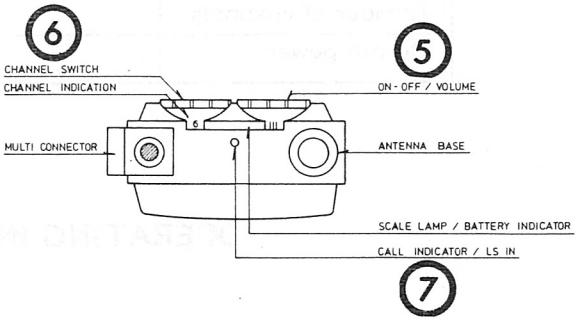
The following functions are incorporated in the CP808:

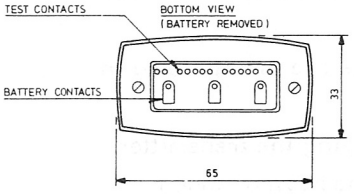
1. push button for keying the transmitter
2. push button for tone keying, tone I
3. push button for tone keying, tone II
4. push button for squelch cancelling-LS in/out.
5. dial-type knob for volume control and on/off switch.
6. 12-position dial-type channel knob
7. call indicator
8. hinged lid for access to the antenna tuning circuit
9. socket for remote control unit
10. socket cover
11. threaded antenna base

Before switching the set on, ensure that the antenna and battery are properly connected.


ANTENNA
MULTI CONNECTOR FOR REMOTE CONTROL
CALL INDICATOR / LS IN
ANTENNA BASE
CHANNEL SWITCH
LS / MC
SQUELCH / LS IN-OUT / SCALE ILLUMINATION
TRANSM KEY
TONE KEY
BATTERY LOCK
TOTAL HEIGHT LESS BATTERY
8
3
2
4
1
STORNOPHONE 800


CONTROL BOX WITH ANTENNA
CB 812
CB 831
CB 851
CB 861
CONTROL BOX WITHOUT ANTENNA
CB 804
CB 805
TRANSM KEY
CONNECTOR FOR HEAD PHONE (CB 805 ONLY)
CALL INDICATOR (CB 805 ONLY)
LS / MC
SQUELCH / LS IN-OUT
TONE KEY (CB 805 ONLY)
CALL INDICATOR
TRANSM KEY
SQUELCH / LS IN-OUT
TONE KEY
7
1
4
2


6
CHANNEL SWITCH
CHANNEL INDICATION
5
ON-OFF / VOLUME
MULTI CONNECTOR
ANTENNA BASE
SCALE LAMP / BATTERY INDICATOR
CALL INDICATOR / LS IN
7


TEST CONTACTS
BOTTOM VIEW (BATTERY REMOVED)
BATTERY CONTACTS
33
65

RECEIVING (WITHOUT SELECTIVE CALLING)

Turn the radiotelephone on by turning the volume control clockwise.

If no signal can be heard, the volume control can be set by pressing the squelch cancelling button while adjusting the volume control for the desired sound level, using the background noise for sound.
Set the channel selector to the channel to be used and release the squelch cancelling button. Any traffic on that channel will now be heard from the loudspeaker.

RECEIVING (WITH SELECTIVE CALLING)

Adjusting the sound level is done as in the sets without tone equipment except that it is necessary to press the SQ/LS button momentarily to switch on the loudspeaker before opening the squelch circuit.

After the setting of the volume control again press the SQ/LS button momentarily to switch off the loudspeaker.

TRANSMITTING (WITHOUT SELECTIVE CALLING)

When the channel is clear, simply press the transmitter key button and speak with a normal voice into the loudspeaker, which functions as a microphone when transmitting.

TRANSMITTING (WITH SELECTIVE TONE RECEIVER)

To initiate a call, turn on the loudspeaker with the LS IN/OUT button, do not transmit until the channel is free.

Press the transmitter key and speak into the loudspeaker/microphone.

To return to stand by, turn off the loudspeaker again with the LS IN/OUT button.

TRANSMITTING
(WITH SELECTIVE TONE TRANSMITTER)

Turn on the loudspeaker with the LS IN/OUT button, do not transmit until the channel is free. Press the tone key button. When the connection is made, use the ordinary transmitter key button when transmitting (when the tone key is activated the microphone is blocked).

When no longer in use, switch the radiotelephone off by turning the volume control completely counter clockwise, i.e. the O on the dial is visible.

ACCESSORIES

ANTENNA

The following antennas are approved for use with radiotelephones type CQP800U and can be attached to either the control head CP808-IS or the control unit.

AN834 200 mm Heliflex Antenna		68 - 88 MHz
AN815 500 mm Whip Antenna		68 - 88 MHz
	and	146-174 MHz
AN816 150 mm Heliflex Antenna		146-174 MHz
AN864 46 mm Heliflex Antenna		420-470 MHz
	and	370-420 MHz
AN865 155 mm Whip Antenna		420-470 MHz
	and	370-420 MHz

All antennas are fitted with a threaded bolt that fits the antenna socket on the control head and on the control units type CB812, CB831, CB851 or CB861.

BATTERY

To power the equipment the following battery types are available:

BU802/808	nickel-cadmium (NiCd) battery, 10.8 V, 225 mAh.
BU807	nickel-cadmium (NiCd) battery, 10,8 V, 450 mAh.

The batteries are encased in a high-impact cast plastic cassette with snap action locks, automatically securing the battery when slid into place.

BATTERY CHARGER

Available battery chargers:

CU801	Charging unit with two outlets for BU802, automatic type.
CU802	Charging unit with ten outlets for BU802, automatic type.
CU804	Charging unit with one outlet. A switch selects high or low charging current as to charge the different battery tupes.
CU805	Charging unit with six outlets and built-in timer; for all types of batteries.

The battery chargers can be operated from either a 110 V or a 220 V AC mains.

EARPHONE

In conjunction with control unit CB805 an earphone, HP801, is available for use in areas where high background noise is encountered. The earphone is supplied complete with cable, connector and ear hanger. Plugging in the earphone does not disconnect the built-in speaker. The lower positions of the volume control are intended as settings for earphone reception.

TONE EQUIPMENT

The radio set can be fitted with tone equipment which is contained in a separate panel placed between the control head and the transmitter/receiver circuitry. Incorporating tone equipment into an existing radio set increases the total length of the unit and requires a new, longer casing. Tone signalling sub-units for CQP800U are as follows:

TT801	single or double tone transmitter, tone frequencies from 885 Hz to 2900 Hz.
TT802	single or double tone transmitter, tone frequencies from 1010 Hz to 3047 Hz.
ST801	four or five tone sequential tone transmitter, tone frequencies from 885 Hz to 2800 Hz.
ST802	four or five tone sequential tone transmitter, tone frequencies, from 960 Hz to 2110 Hz.
SR801	four or five tone sequential tone receiver, tone frequencies from 885 Hz to 2900 Hz. (can also be coded for use as a double tone receiver).
SR802	four or five tone sequential tone receiver, tone frequencies from 960 Hz to 2110 Hz.
TQ802	three, four, or five sequential tone transmitter/receiver, tone frequencies from 885 Hz to 2800 Hz. By means of a plug-in module, SU808, the TQ802 can detect group calls.
TQ803	three, four, or five sequential tone transmitter/receiver, tone frequencies from 960 Hz to 2110 Hz. By means of a plug-in module, SU808, the TQ803 can detect group calls.

CARRYING DEVICES

The following devices are available for carrying the CQP800U:

CK801a carrying harness for all types of equipment, mounting hardware, short and long straps, belt and clamps.

CK802 screw mounted pocket clip.

CK803a shoulder strap with retainer for remote control unit. (for remote control, only).

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CONTROL PANEL WITH TONE SWITCHING

CP8017

CP8017 is a variant of the control panel to be used in conjunction with the CQP800U family. CP8017 has the same function as CP808 and beside these, CP8017 include facilities for 2 telegram tone switching, with one fixed telegram and one variable 100 call telegram. Operation of the 2 telegram tone switching is done by means of the Tone Key pushbuttons I and II.

Tone Key I will send the fixed telegram preset at the factory.
Tone Key II will send the variable telegram. Two of the 5 sequential tones can be selected by means of 2 rotary switches placed on the loudspeaker panel.

MODE OF OPERATION

OPERATING INSTRUCTIONS

The fixed telegram sent by depressing Tone Key I is used to call the base station.
The variable telegram sent by depressing Tone Key II is used to call other portables via the base station which works as a repeater.

Calling a portable

If the portable has a specific calling number 62 for ex.:
Turn the rotary switch X10 on 6 and X1 on 2.
Push Tone Key I which establishes contact with the base station.
If the channel is free, push Tone Key II and wait for an answer from the other portable station.
Then the transmission can take place.

FUNCTION

Tone Key I

Fixed telegram.

When Tone Key I is activated, a logic "1" will be applied to the latch formed of IC1a and IC1b, causing a logic "1" from pin 4 IC1b to the gates IC2a pin 2 and IC2b pin 5.

In the same time TQ802/3 has also been activated from Tone Key I, and when the counter IC2, according to the selected digits combination in TQ802/3, applies a logic "1" via terminal B to the gate IC2b, this will go "high" in this particular sequence and via terminal D activate the chosen ST gate transistor.
In the same way the gate IC2a will activate the next chosen ST gate via the connections to the TQ802/3.

Tone Key II

Variable telegram.

The 2 rotary switches have to be set to the requested figures in the variable telegram.
When Tone Key II is activated, a logic "1" will be applied to the latch formed of IC1a and IC1b, causing a logic "1" from pin 3 IC1a to the gates IC2c pin 9 and IC2d pin 12.

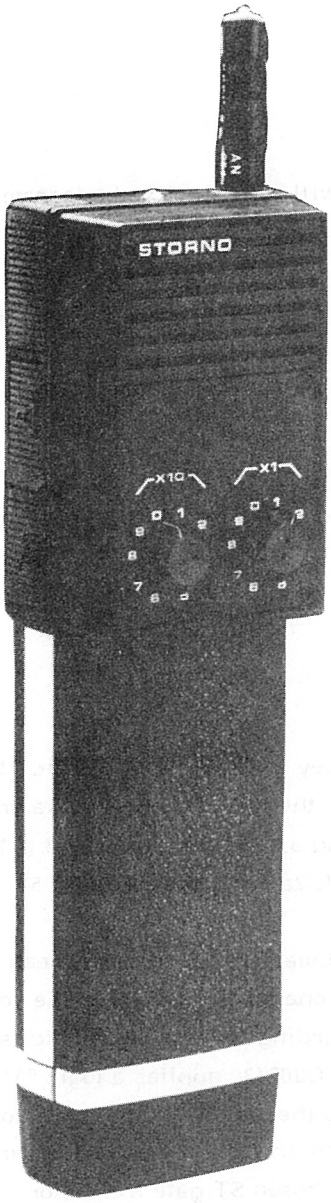


Fig. 1 CQP800U RS

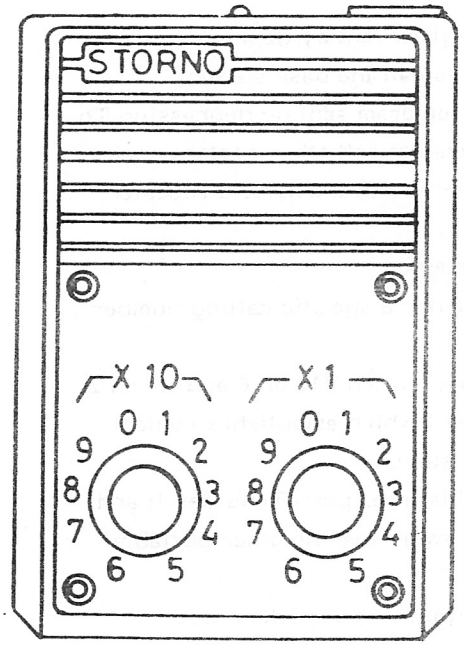


Fig. 2 Control Panel CP8017

These 2 gates will be activated sequentially when they receive a logic "1" on pin 8 or 13 from the ST counter IC2 in TQ802/3, in the same manner as described under Tone Key I for the gates IC2a and IC2b.

When IC2c and IC2d in turn goes "high", they will activate the ST gate transistors Q1 and Q2 on the CP8017, and thereby in turn make connections for the rotary switches X10 and X1, which are wired to L1 in TQ802/3.

CODING AND STRAPPING

Coding and strapping instructions for TQ802/3 will be unchanged for the fixed telegram transmitted by Tone Key I.

When coding and strapping a CP8017/TQ802/3, the following decisions must be made:

1) Which digits will be the variable ones, to be dialled on X10 and X1.
2) frequencies of the fixed tones.

NUMBER COMBINATIONS

Digits 2 and 4 variable

1) Ex: | 3 | V_1 | 3 | V_2 | 3 |

To allow the greatest number of combinations, strap CP8017 as follows:
Cut the PWB just outside the soldering terminal 3 at the printed switches X10 and X1 and strap soldering points 3 to soldering point for repeat tone R or Y. (see fig. 3.)

R= repeat tone in 20/25 kHz channel spacing equipment.

Y= repeat tone in 12.5 kHz channel spacing equipment.

2) Ex: | 2 | V_1 | 4 | V_2 | 3 |

Strap CP8017 as follows:
Cut the PWB just outside the soldering terminal 2 at the printed switch X10 and outside the soldering terminal 4 at X1 and strap 2 and 4 to soldering for repeat tone R or Y.
(see fig. 4.)

3) Summary.

If the fixed code is represented by A, B and C:

A	V_1	B	V_2	C

If A/B/C and CP8017 is strapped as above all combinations will be permissible.

If A/B/C, CP8017 strapped, there are 21 limitations:
- V_1 must not be selected equal to B.
- V_2 must not be selected equal to C.

Digits 3 and 5 variable

A	B	V_1	C	V_2

10 limitations

V_1 must not be selected equal to C.

Strapping:
Cut at X10 terminal corresponding to fixed tone B, cut at X1 terminal corresponding to fixed tone C and strap both to repeat tone R or Y.

Digits 4 and 5 variable

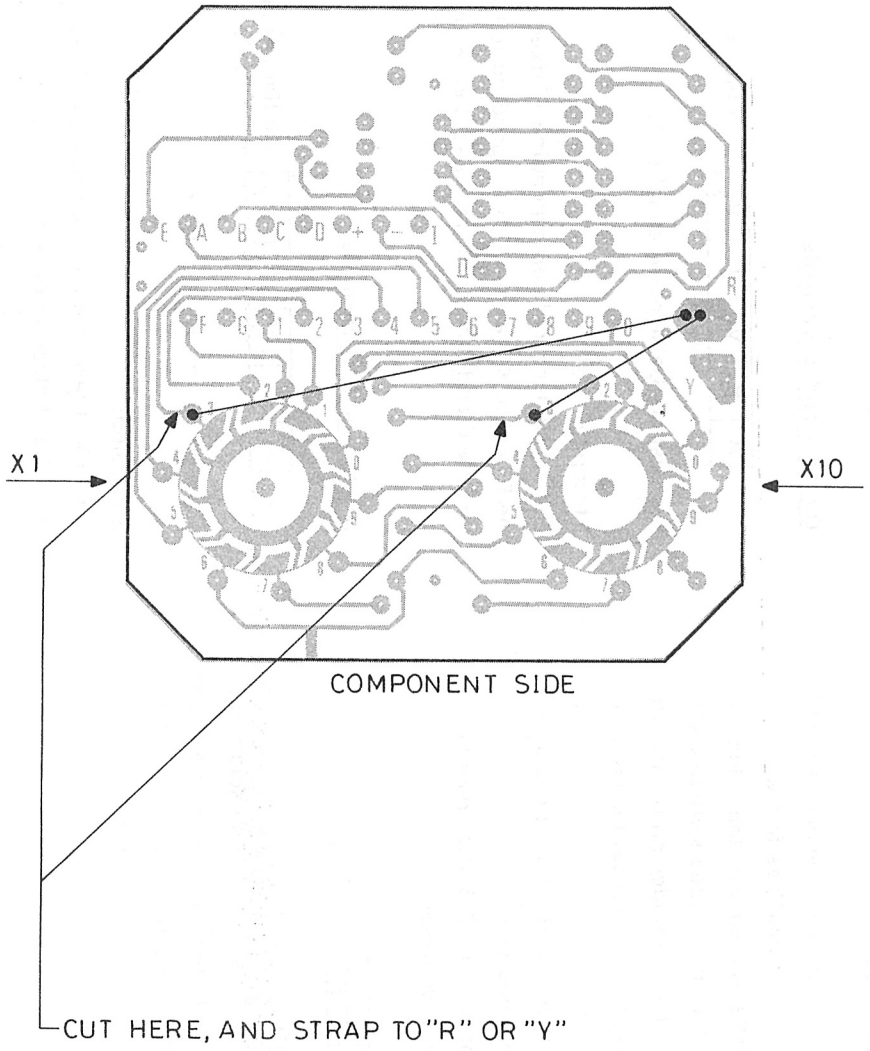
A	B	C	V_1	V_2

10 limitations

V_1 must not be selected equal to V_2.

Strapping:
Cut at X10 terminal corresponding to fixed tone C and strap to repeat tone R or Y.

Fig. 3 Example for use of repeat tones in call number 3 V_1 3 V_2 3.



CODING AND STRAPPING CP8017

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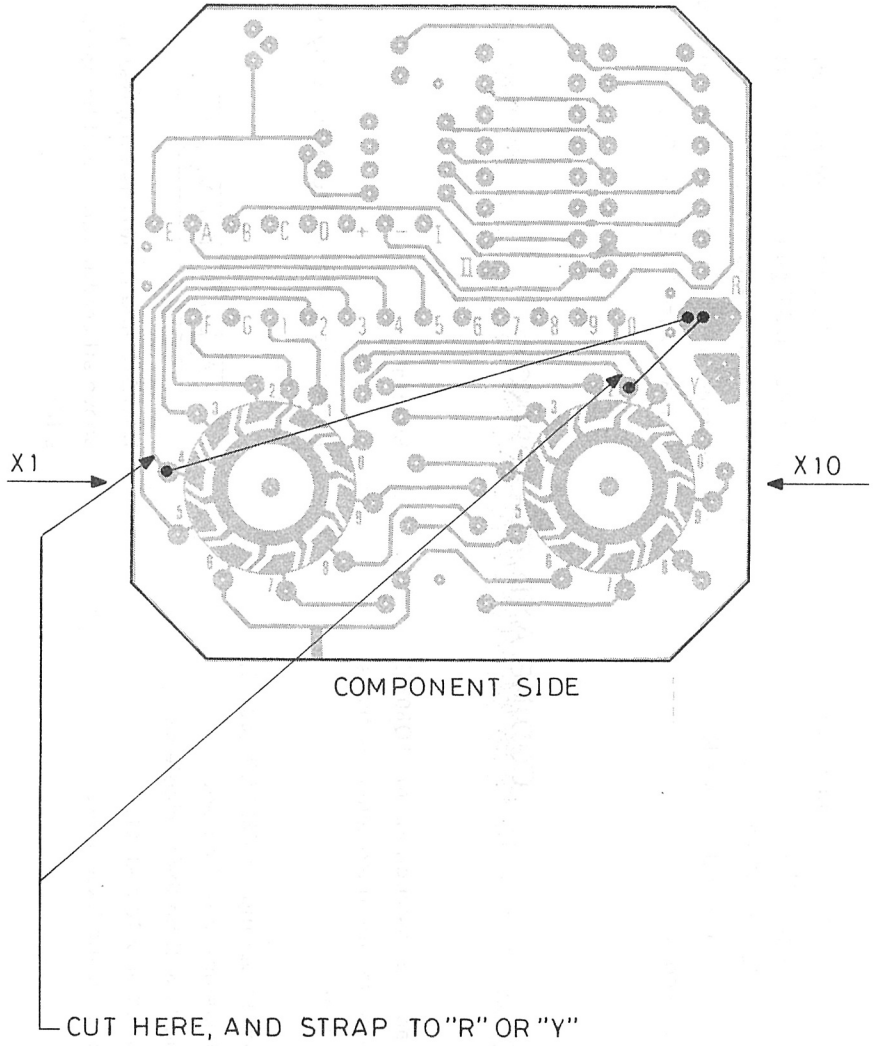
Fig. 4 Example for use of repeat tones in call number 2 V_1 4 V_2 3.



CODING AND STRAPPING CP 8017

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X1 = units, X10 = decade units in the variable part of the call number.

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Storno

Digits 1 and 3 variable

V_1	A	V_2	B	C

21 limitations

V_1 must not be selected equal to A.
V_2 must not be selected equal to B.

Strapping:
Cut at X1 terminal corresponding to fixed tone A and strap to repeat tone R or Y.

COMBINATIONS OF THE VARIABLE DIGITS IN TQ802/3

Individual combinations of the variable digits in TQ802/3 are possible, even though digits 3 and 5 are the most common.
For establishing the connection of the variable digits, see fig. 5 and fig. 6.
Terminals BD represent the "decade units" and terminals AC represent the "units" in the variable part of the call number.

If for example digits 2 and 4 in a 5 tone sequential call number are chosen to be the variable ones, connections of the terminals A - B - C - D must be done in the following way.

Digits 2 (decade units)
Cut the PWB outside A2/B2 (fig. 6))
Connect terminal B to the soldering terminal A2/B2 and terminal D to the soldering terminal C2/D2.

Digits 4 (units)
Cut the PWB outside A4/B4 (fig. 6))
Connect terminal A to the soldering terminal A4/B4 and terminal C to the soldering terminal C4/D4.

Coding and strapping of the SR part of TQ802/3 will be unchanged, and the remaining tones in the variable telegram will be the same as in the fixed telegram.

This completes the establishing of the two variable digits.
Other combinations may be done in a similar way.

CODING AND STRAPPING CP8017

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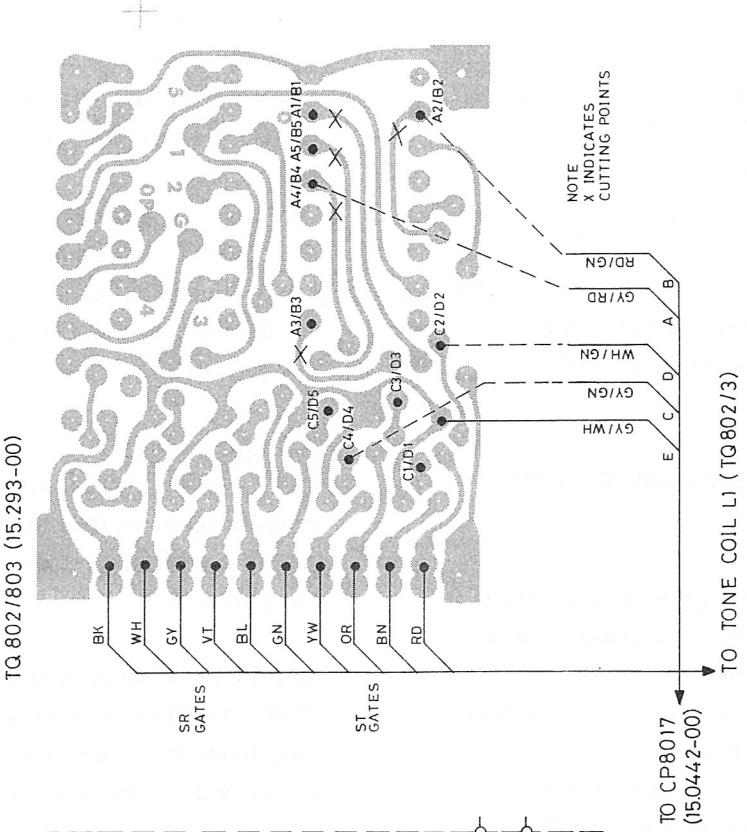


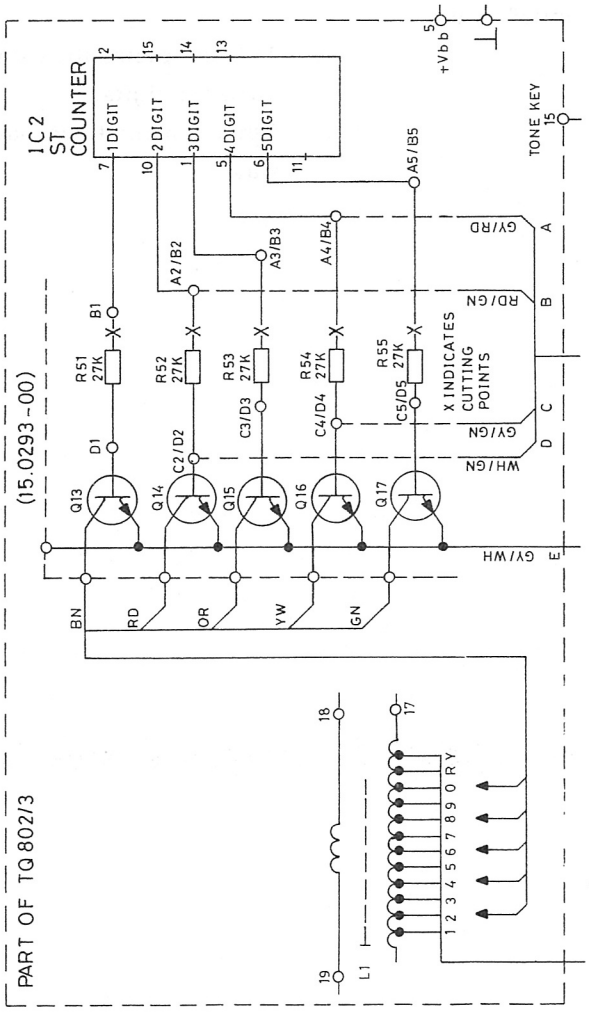
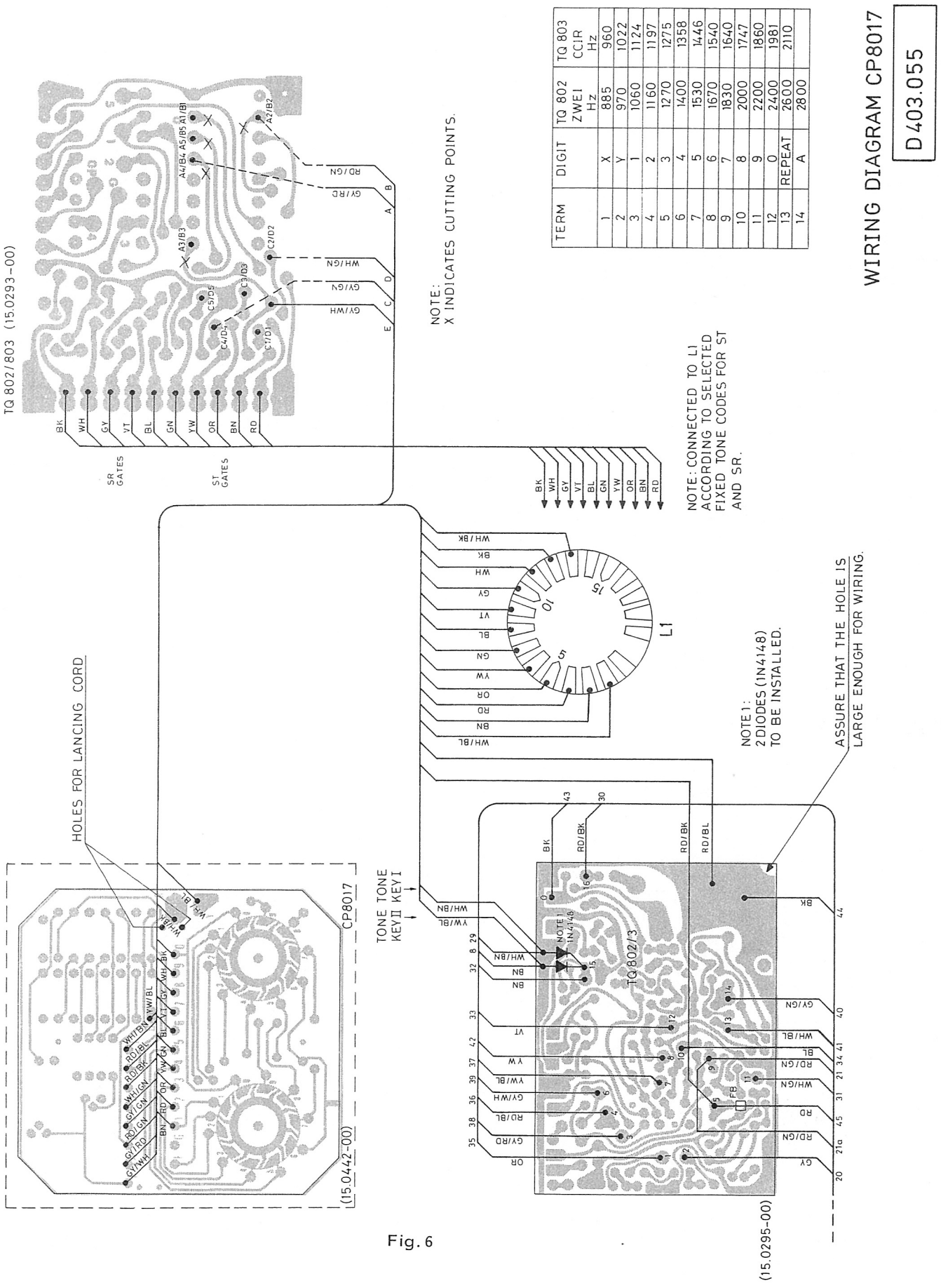


Fig. 5



TERM	DIGIT	TQ 802 ZWEI Hz	TQ 803 CCIR Hz
1	X	885	960
2	Y	970	1022
3	1	1060	1124
4	2	1160	1197
5	3	1270	1275
6	4	1400	1358
7	5	1530	1446
8	6	1670	1540
9	7	1830	1640
10	8	2000	1747
11	9	2200	1860
12	0	2400	1981
13	REPEAT	2600	2110
14	A	2800	

Fig. 6

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CQP860U
CIRCUIT DESCRIPTION

Transmitter Circuit (see block diagram)

The transmitter is built up of several modules, each of which is completely enclosed (shielded) and has connector pins protruding from the bottom of the module. All the modules are then mounted onto a mother board.

The transmitter section consists of the following modules:

XO862	Crystal Oscillator
AA802	Modulation Amplifier
FN803	Modulation Filter for 20/25 kHz channel separation
PM861	Phase Modulator
FD861	1st Frequency Doubler
FD862	2nd Frequency Doubler
BP861	Band Pass filter
PA863	1st Power Amplifier and Antenna Switch
PA864	2nd Power Amplifier and Antenna Switch
FN861	Antenna Filter
AD801	ADC Circuit
VR801	Voltage Regulator

Modulation Amplifier AA802 and FN803

The modulation amplifier function is carried out by the Modulation Amplifier, AA802 in conjunction with a Modulation Filter, FN803. The microphone signal is applied to an operational amplifier, the degree of negative feedback, and thus the amplifier gain, can be adjusted by means of an external resistor. Microphone sensisitivy can then be adjusted to suit individual requirements. In radio sets with built-in tone transmitters or sequential tone transmitters, the microphone amplifier is disabled by the tone key.

The amplified AF signal is applied to a limiter via a differentiating network. The limiter is wise an operational amplifier utilising negative feedback. Following the limiter is an integration network and an active element is another operational amplifier. The active filter removes any harmonics of the original input signal that arise during limiting action, and it also keeps the frequency excursions within the tolerances required for the channel spacing used in the particular equipment. An extra limiter is inserted between the integration network and the active lowpass filter to prevent strong input signals of low frequencies from overloading the filter.

Transmitter Oscillator XO862

The transmitter exciter signal is generated by a crystal, Colpitts-type oscillator operating on the crystal's fundamental frequency, which will be in the range of 52.50 to 58.75 MHz. The oscillator starts when the channel selector completes the circuit path to chassis ground. The collector circuit is tuned by a variable capacitance diode which also detunes the resonant circuit whenever the channel switch breaks the ground connection. Thus several oscillators can be tied in parallel without mutual loading effects. The output signal is capacitively taken off the tank circuit. The maximum number of channels is 12, with all oscillators placed in an oscillator panel.

Phase Modulator PM861

The Phase Modulator consists of an input- and an output buffer plus a phase modulator stage. The exciter signal from the oscillator is fed to the input buffer stage. This amplifier, with fol-

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lowing π network, ensures a constant sine wave signal to the phase modulator. The modulator is a transistor amplifier stage where the modulating audio signal is applied to the emitter, which is RF decoupled. The modulation signal varies the transconductance (g_m) of the amplifier and thus the phase angle (φ) of the RF signal at its output. To function properly, the modulator must work into a constant load and is therefore followed by a buffer stage whose output signal is sufficient in amplitude to drive the following stage, a frequency doubler.

Multiplier Chain FD861, FD862, FD863

The multiplier chain consists of three very similar frequency doubler stages. Each frequency doubler operates as a grounded emitter transistor amplifier followed by two inductively coupled LC circuits that are tuned to the second harmonic of the input frequency.

Band Pass Filter BP861

To ensure suppression of the undesired harmonics that arise in the frequency multiplying process, the multiplier chain is terminated by a double tuned band pass filter, the BP861.

Power Amplifier PA861 and PA862a/PA864

The output power from the Multiplier chain (approx. 15 mW) is amplified the required antenna power (0.1 to 1.0 W or 1.0 to 3.0 W) in a three-stage amplifier composed of the PA863a (1W) or PA864 (3W) modules.

PA863 contains two amplifier stages. The collector voltage to the first transistor is supplied via the ADC Circuit, and is variable. If more gain is required to drive the following PA862a/PA864 the collector supply (ADC) voltage will rise. On the other hand, if the drive signal is more than enough, the ADC voltage will drop.

PA862a/PA864 contains the transmitter final amplifier plus a circuit for electronically switching the antenna between the transmitter and the receiver. Collector current for the second transistor in PA863 passes through the switching diodes, whereby they can be considered to be virtual short circuits. This connects the Power Amplifier output to the antenna while short circuiting the receiver input. When receiving, the diodes become reverse biased, effectively isolating the transmitter from the antenna while connecting the antenna to the receiver input.

ADC Circuit AD801

The transmitter output current is kept very nearly constant by means of the ADC Circuit. The voltage drop across a small resistor in the output transistor's collector return is monitored by the ADC stage, which then regulates the collector voltage to the first transistor amplifier in the PA863 stage with the net effect of cancelling any variations and thus keeping the RF output at a constant value. The amount of current through the output stage, and thus the output power, can be set by means of a resistor mounted on the mother board.

Antenna Filter FN861

A nine-pole lowpas filter having a cutoff frequency of 470 MHz is inserted between the transmitter output and the antenna. The filter suppresses any harmonics created in PA862 /PA864. A 21.4MHz band stop filter at the FN861 input prevents any signals close to the intermediate frequency from reaching the receiver circuits.

Receiver Circuit (see block diagram)

The receiver is a double conversion superheterodyne using intermediate frequencies of 21.4MHz and 103.5 kHz. Channel selectivity is achieved by means of a crystal filter in the first IF circuit. The radiotelephone can be fitted with up to 12 channels, one oscillator per channel.

All the oscillators are arranged in parallel on a special oscillator panel which also contains

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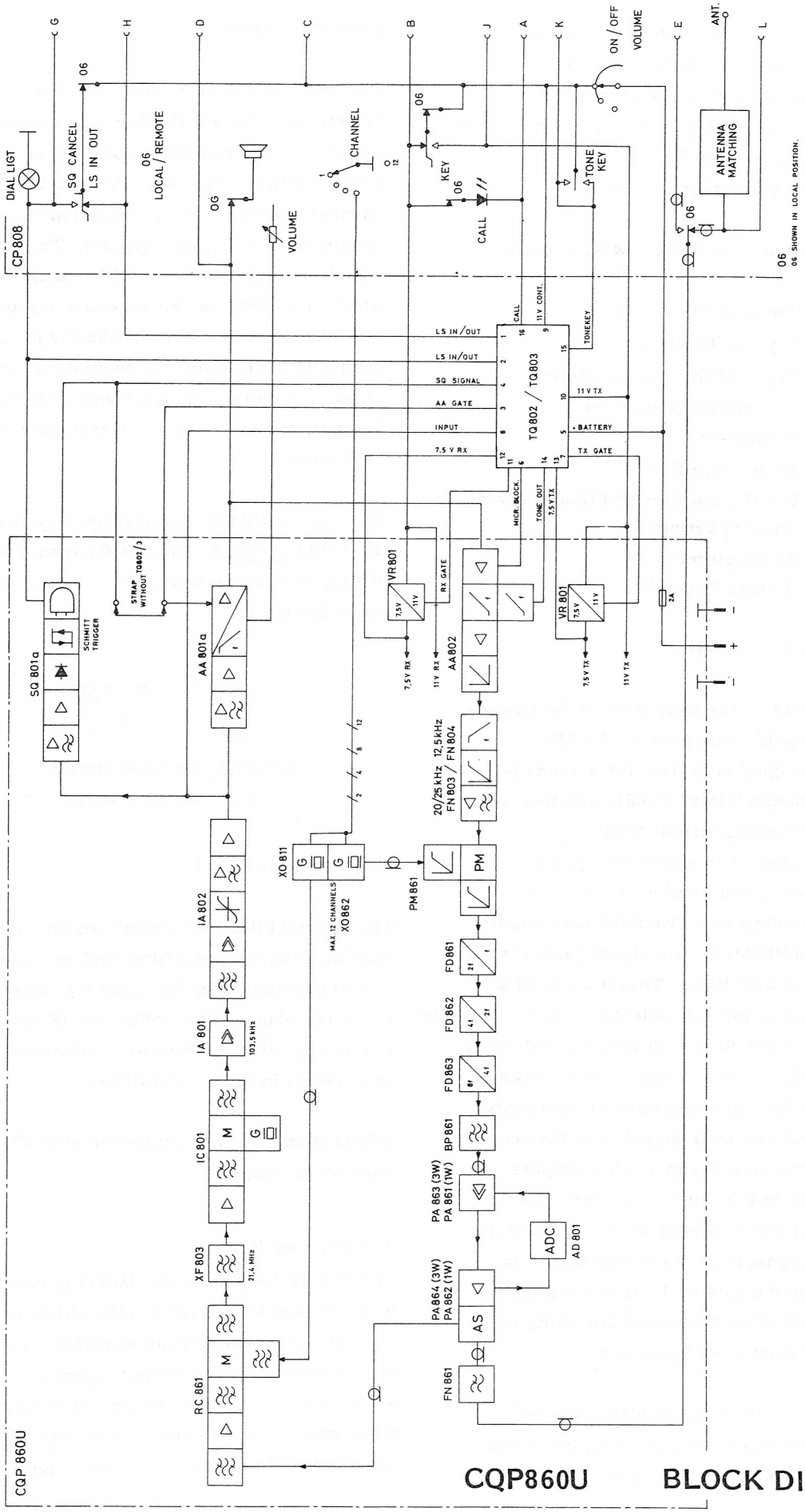

CQP860U BLOCK DIAGRAM

the transmitter oscillators. The receiver employs an electronic squelch circuit whose threshold can be set with a resistor on the mother board. There is a pushbutton for cancelling the squelch on the control head or on the control unit, whichever is used.

The receiver consists of the following modules:

RC861	Receiver Converter
XO811	Crystal Oscillator
XF803	Crystal Filter for 20/25kHz channel separation
IC801	IF Converter
IA801	1st IF Amplifier
IA802	2nd IF Amplifier and Discriminator
SQ801a	Squelch Circuit
AA801	AF Amplifier
VR801	Voltage Regulator

Receiver Converter RC861

The RC861 converts the frequency of the antenna signal to the 1st IF frequency of 21.4 MHz. The incoming signal path from the antenna is trough the Antenna Filter, FN861, and then via the antenna switching circuit to the input of the RC861. The signal then passes through a two-element bandpass filter to a transistor operating as a grounded base amplifier. After amplification, the signal passes trough a three-element UHF filter. This filter is what mainly determines the r.f. selectivity of the converter. The signal is taken off at a 50-ohm tap and fed to the mixer via L7, a transformer that serves as an adjustment for achieving optimal sensitivity/gain. The local oscillator signal from the XO module(s), after passing through a lowpass filter, proceeds to a frequency tripler. The filter allows only the oscillator signal to reach the tripler. The signal from the tripler output is then applied to the gate of the mixer transistor, which is a field effect transistor operating in the grounded source configuration.

The IF signal is taken off via a combination autotransformer/L network to match the impedance of the following crystal filter.

Oscillator XO811

The local oscillator signal of 124 to 153 MHz is generated in the Hartley type crystal oscillator where the transistor operates as a grounded base amplifier. The oscillator starts when the channel selector switch completes the emitter circuit path to chassis ground. The collector circuit is tuned by a variable capacitance diode which also detunes the resonant circuit whenever the channel switch breaks the ground connection. Thus several oscillators can be tied in parallel without mutual loading effects. The output signal is capacitively taken off the tank circuit.

The local oscillator signal frequency lies 21.4 MHz under the antenna frequency and the formula for calculating the crystal frequency is therefore:

$$f_x = \frac{f_a - 21.4\ \text{MHz}}{3}$$

(where f_x = crystal frequency and f_a = antenna frequency)

Crystal Filter XF803

The Crystal Filter unit comprises an eight-pole monolithic crystal filter and an impedance matching transformer for matching the output to the impedance of the following IF converter. Practically all of the receiver selectivity is achieved in the crystal filter.

XF803 is employed in equipment with 20/25 kHz channel spacing.

IF Converter IC801

The first IF frequency (21.4MHz) is converted to the second IF frequency (103.5kHz) in this module, which contains an amplifier, a mixer and an oscillator. The output signal is taken off from a center tap on the coil in the mixer transistor's collector circuit and applied to an intermediate frequency amplifier, IA801.

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IF Amplifier and Discriminator IA801 and IA802

The first Intermediate Frequency Amplifier, IA801, consists of two differential amplifiers in cascade. The output signal is applied to the second Intermediate Frequency Amplifier, IA802, which contains a 103.5 kHz bandpass filter, a quadrature detector, a lowpass filter and an audio frequency amplifier.

The IF amplifier, detector and AF amplifier are all included in one integrated circuit.

The balanced quadrature detector has excellent AM suppression and contains only one tuned circuit. Inserted between the detector and the AF amplifier is an active lowpass filter which removes any superimposed IF signal. The detector bandwidth and the audio amplifier output voltage can be regulated by means of two external resistors on the mother board (AF output at 1000Hz = 110 mV.)

AF Amplifier AA801a

The audio frequency signal from IA802 is fed to the AA801a AF Amplifier where it becomes amplified to the desired audio power level. First the signal passes through an active high-pass filter that rejects any low frequencies (noise). Next comes an integrated circuit containing two separate amplifiers which make up the preamplifier and output stage. The volume control is inserted between these two amplifiers. The Preamplifier also operates as an active lowpass filter suppressing frequencies above 3000 Hz and the output amplifier gives the required receiver de-emphasis (integration).

The Squelch Circuit can block the AF signal path by grounding the squelch terminal (5). When the squelch output goes positive again, the audio amplifier will operate normally.

Squelch Circuit SQ801a

The receiver Squelch Circuit operates automatically, according to the noise content of the antenna signal. Weak signals contain greater noise than acceptable signal levels. The output AF signal from IA802 is also present at the input to SQ801a, where it must first pass through an active highpass filter that suppresses frequencies under 7kHz. Higher frequencies become amplified, then detected and whenever the signal-to-noise ratio is objectionable, the detected noise signal will be sufficient to turn off the audio amplifier. With an acceptable signal strength at the antenna, the noise content will be too low to trigger the squelch, and the positive collector supply (+ V_{cc}) will be available to the audio amplifier's gating terminal allowing it to operate normally. An external resistor sets the squelch to open the path for a signal-to-noise ratio of > 12 dB SINAD. A pushbutton on the control head/control unit allows manual cancelling of the squelch function.

Power Supply and Voltage Regulator VR801

Because of variations in the battery voltage as the battery discharges, two VR801 type Voltage Regulators are employed to supply many of the transmitter and receiver circuits in the CQP800 with a constant 7.5V potential. The regulators are short circuit protected.

MICROPHONE MC704

GENERAL

Microphone MC704 is designed for mobile operation with radiotelephones of series 600 and 700. It consists of an amplifier type AA705 and a microphone cartridge in a plastic housing, a cable for connecting, to the radio unit, and a mounting bracket.

Amplifier AA705

The microphone amplifier serves as band-pass filter for the audio frequency band 300 Hz - 3000 Hz and amplifies the signals from the microphone to a suitable level.

The amflifier consists of three transistors, Q1,Q2, and Q3 all DC-coupled. The gain is determined by the feed-back circuit R1,R2,R11 and C9, and with potentiometer R1 the gain can be adjusted to a suitable microphone sensitivity.

The RC-circuit C2,C3,R4,R6, and R3 form in association with the feedback amplifier an active highpassfilter which attenuates all frequencies below 300 Hz.

Resistor R11 and capacitor C9 in the feedback loop cut off frequencies above 3 kHz, and C7 stabilises the closed loop gain.

A number of capacitors, C4,C5,C6,C8,C10, and resistor R5 serves to filter and by-pass RF.

Specifications

Supply Voltage

9 - 24 V

Current Consumption

9mA ± 2mA (9V)

32mA ± 5mA (24V, R_L = 600 ohm)

Output Level

Nominal: - 17 dBm

Maximum: + 3 dBm

Distortion at + 3 dBm

Less than 3%

Gain

Maximum: 58 dB ± 4 dB

Minimum: 39 dB ± 4 dB

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VEHICLE ADAPTOR MN803 AND MN804

The vehicle adaptors MN803 and MN804 are designed to hold a STORNOPHONE 800 U radiotelephone when used in a mobile installation. Both adaptors also contain a facility for the BU800 battery to be trickle charged from the vehicles storage battery, and a connection for a mobile antenna. Futhermore an optional, external loudspeaker with a built-in 2 watt AF amplifier, type LS801, may be connected to the units.

Operating the CQP800U with an MN803 installation is locally on the radiotelephone by using its built-in controls. When using MN804 the operation is by means of an external microphone, MC704, external switches SU809, and loudspeaker LS801.

The electrical connections between the adaptor and the CQP800 U is by means of a multiwire cable connecting to the socket on the CQP800 U.

The simplified diagram shows the elements necessary to charge the battery through the multiwire cable and, at the same time pass the RF and AF signals.

MODE OF OPERATION

Charging Circuit

The DC converter has floating input potential in order to operate with both + (positive) and -(negative) chassis installations. It operates as a blocking oscillator and consists of transformer T1 and transistor Q2 which has a high current amplification factor (β), when saturated.

The oscillator configuration has a constant current charateristic which, together with resistors R11, R16, R17, and R18, produce 55 mA of charging current for the BU 800 battery.

Transistor Q1 and the resistors R1, R2, and R3 compensate input voltage fluctuations, and diode E1, together with an externally mounted fuse, protects the unit against incorrect supply voltage polarity. The network, E2, R9, R10, and C5 protects Q2 from transient spikes.

Zener diode E7 ensures that the output voltage does not exceed the maximum allowable input voltage to CQP800 if the battery is removed during operation.

Temperature Characteristics

For battery protection reasons the charging current must be reduced at high or low ambient temperatures. The decreasing regulation, when cold, is performed by a PTC resistor and, when hot, by the NTC resistor R12. At temperatures outside the working range the PTC and NTC resistances decrease, respectively, and the base current of transistor Q3 is reduced and this brings it out of the saturated condition. The consequences are an increased Q3 emitter voltage and an increased voltage across the zener diode, which begins to conduct and gradually takes over the constant current from the DC converter. The net effect is the charging current being decreased.

Charging Indicator.

In series with the charging circuit a light emitting diode, LED E6, is inserted to indicate the charging current flow.

Call Indicator

In systems using selective calling a green LED call indicator, E8, is mounted on the front of the MN803/ MN804, and it will be controlled by the tone receiver.

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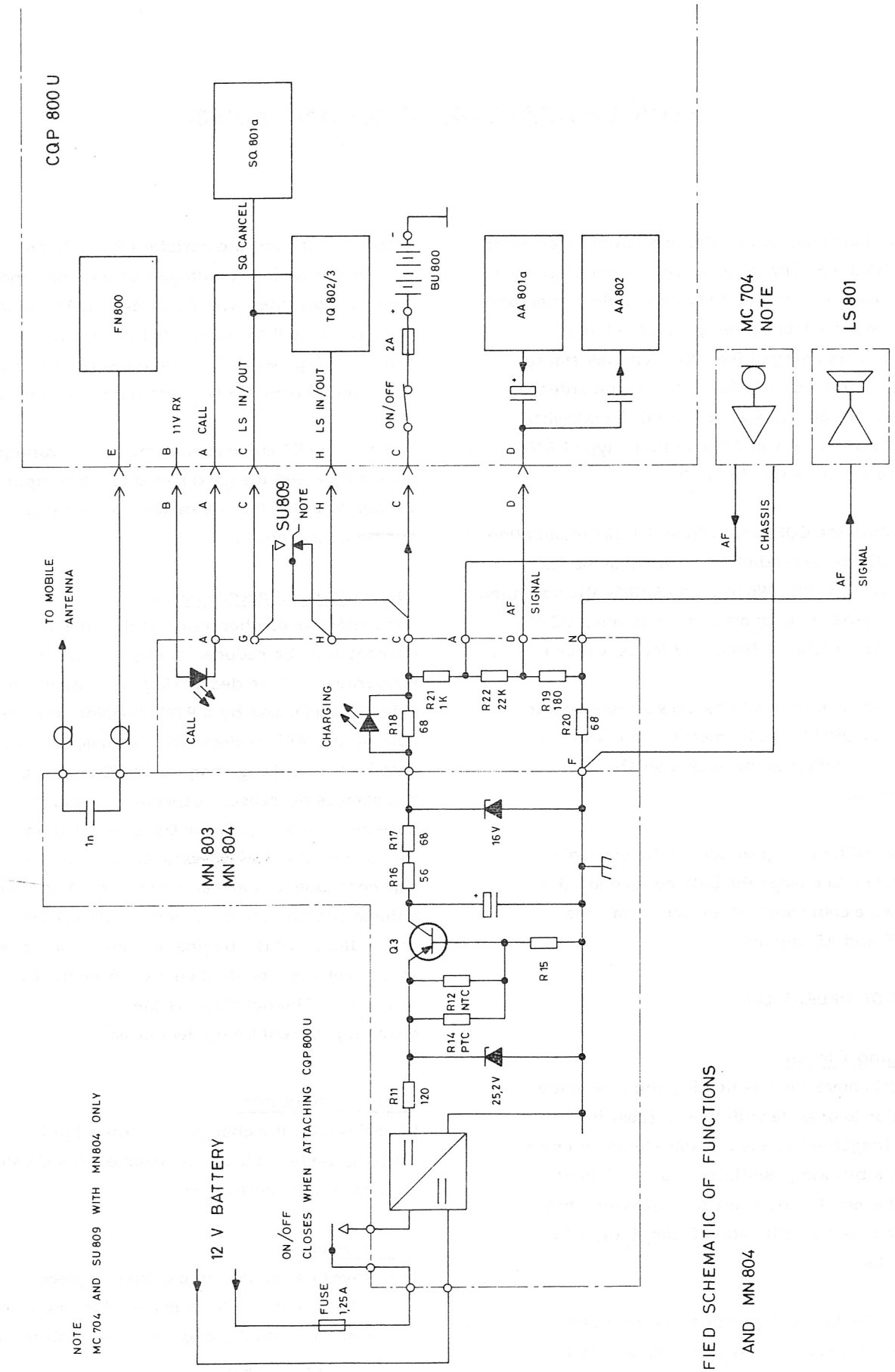

SIMPLIFIED SCHEMATIC OF FUNCTIONS

MN 803 AND MN 804

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Loudspeaker LS801

When mounting the external loudspeaker two resistors, R19 and R20, attenuate the CQP800 U audio level to match the amplifier input sensitivity of LS801.

Microphone MC704

When using MN804 and MC704 two resistors, R21 and R22, attenuates the microphone output to a suitable level for the CQP800 U.

SQ / LS Switch SU809.

The switch, O2, which can be used with MN804 only, mount on the steering coloumn and operates the squelch cancel function, and the LS in/out function if selective calling is used.

TECHNICAL SPECIFICATIONS

Supply Voltage, nominal

13.6 V

Supply Voltage Range.

min. 10.5 V

max. 16.0 V

Supply Voltage Polarity

+ (plus) or - (minus)

on chassis

Current Consumption

Typical values : 160220 mA

10.5 V supply : 220 mA

16,0 V supply : 160 mA

Charging Current

Typical value in the temperature range

+ 10°C to + 40°C,

with battery BU 802:

560 mA

Temperature range

Working range with normal charging current:

+ 10°C to + 45°C

Working range with reduced charging current:

- 25°C to + 70°C.

Dimensions

Unit overall: 148 x 75 x 40 mm

Printed circuit board: 92x 58 x 20 mm

Weight

0,46 Kg

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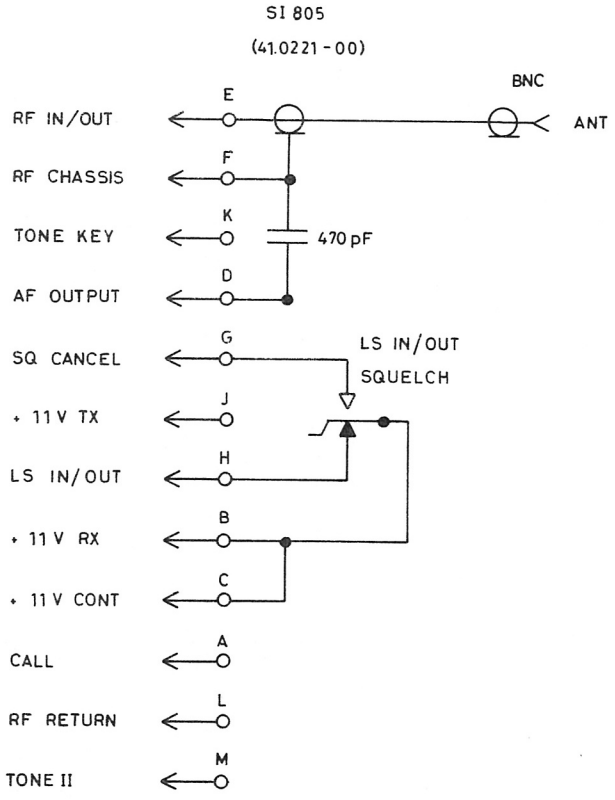
TEST ADAPTOR

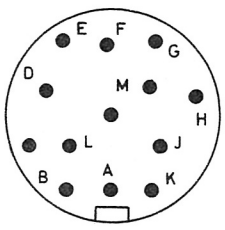
SI805

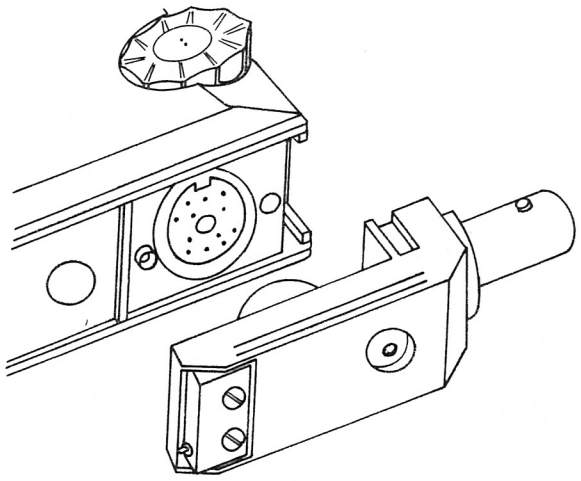
SI805 is a measuring adaptor to be used in conjunction with Test Set TS-C35 and CQP800U personal radiotelephones.

When the SI805 is plugged into the CQP800's control unit socket the following is obtained:

- a 50 ohm interface via a BNC connector
- a switch for LS in/out - Squelch on/off - SR
- the CQP800U is switched into remote control mode which is suitable for TS-C35. The internal loudspeaker, though, remains in function (strap D-M).
- the CQP800U receiver is supplied from the TS-C35 via strap C-B.







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ADJUSTMENT PROCEDURE

CQP863/CQP864U

The following measuring instruments are required for tracing faults in and making adjustments to the transmitter/receiver circuits:

Control unit C35	Code 95B0363, including
Test cable SI801	Code 19B0027
Test cable adaptor SI803	Code 41.0206
Measuring adaptor SI805a	Code 41.0221-01
Loudspeaker 25 ohm	Code 97.5039
Antenna alignment unit TS-D37	Code 95B0555
RF test probe	Code 95.0059
DC ampere meter	10 mA/100 mA/1 A
DC voltmeter	Z_{in} = >0.5 Mohm
AC voltmeter	Z_{in} = >2 Mohm//50 pF
FM signal generator	420 - 470 MHz
AF generator	Z_{out} = 600 ohm
RF wattmeter	0 - 3 W
Modulation meter	
Distortion meter	
Oscilloscope	
Power supply	0 - 20 V/1 A Preset current limiter 0 - 1 A
E-12 resistor box	code 95B0470
Power supply (only CQP864U)	0 - 10 V
Frequency counter	
Trimming tools	17.0035-10 (17.0053-00) 17.0012-00

OPERATING CONTROL UNIT C35

The control unit and test cable C35 are designed for testing and adjusting STORNOPHONE 800/800U. The instruments connect to the unit and remain connected during the procedure.

The front panel of the unit is divided into three parts.

1. The TEST CONTROLS are used to control the radio circuits.
2. The BFO is a 21.4 MHz crystal controlled oscillator.
3. The INSTRUMENT TERMINAL is used for measuring instrument connections.

CONNECTION ON THE REAR PANEL

TEST PLUG	34-way connector for the test cable.
POWER SUPPLY	Jacks for power supply.
CURRENT MONITOR	Jacks for current monitor.
AUDIO MONITOR	BNC connector for external 25 ohm loudspeaker

CONNECTIONS ON THE FRONT PANEL

RF PROBE	Jacks for RF probe.
DCVM	Jacks for DC voltmeter.
AF PROBE	BNC connector for AF probe. Probe consists of shielded leads to be connected whenever measuring of audio is desired.
DEVM (AF)	BNC connector for the AF output of the deviation meter.
ACVM	BNC connector for the AF voltmeter, distortion meter and oscilloscope.

MOD INPUT	BNC connector for the AF generator.

TOGGLE SWITCHES

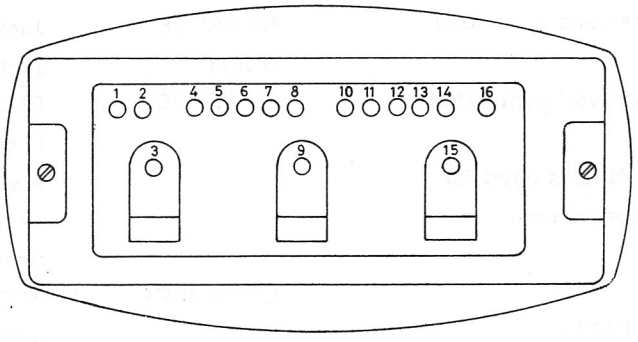
SQ OFF	Disables the squelch circuit of the receiver (loudspeaker continously open).
KEY	Switches the transmitter on, the receiver off, and connects the AF generator input jack to the LS/MICR switch.
TONE KEY	Transmitter key for radio sets with tone transmitter.
RX GATE	Switches the receiver's +7.5 V on/off.
TX GATE	Switches the transmitter's +7.5 V on/off.
ON-OFF	21.4 MHz crystal controlled BFO on/off.
LINE OUT	Switches the AC voltmeter between the LINE OUT and LS/MICR.
ACVM	Switches the AC voltmeter between the LINE OUT - LS/MICR switch and DEVM (AF) - AF PROBE switch.
DEVM (AF) switch	Switches the AC voltmeter input between the deviation meter and the AF probe.

SELECTORS AND CONTROLS

DCVM switch	6-position DC voltmeter switch. 1. SUPPLY voltage. 2. RX +7.5 V stabilized RX voltage. 3. RC receiver converter test point. 4. TX +7.5 V stabilized TX voltage. 5. ADC voltage 6. RF PROBE
AMPLITUDE	BFO output attenuator.

LIST OF TEST POINTS

Test Point	Function
1	+7.5 V TX stabilized
2	+7.5 V RX regulator gate
3	DC ground (connected to point 15)
4	ADC voltage
5	Audio output - microphone input
6	Tone Key
7	+7.5 V TX regualtor gate
8	$+V_B$ battery voltage measured after the fuse
9	+11 V battery
10	+11 V TX
11	+7.5 V RX stabilized
12	Squelch disable
13	Receiver converter test point
14	21.4 MHz signal input
15	DC ground (connected to point 3)
16	Discriminator and receiver line output



BOTTOM VIEW

Fig. 1. TEST POINT LOCATION

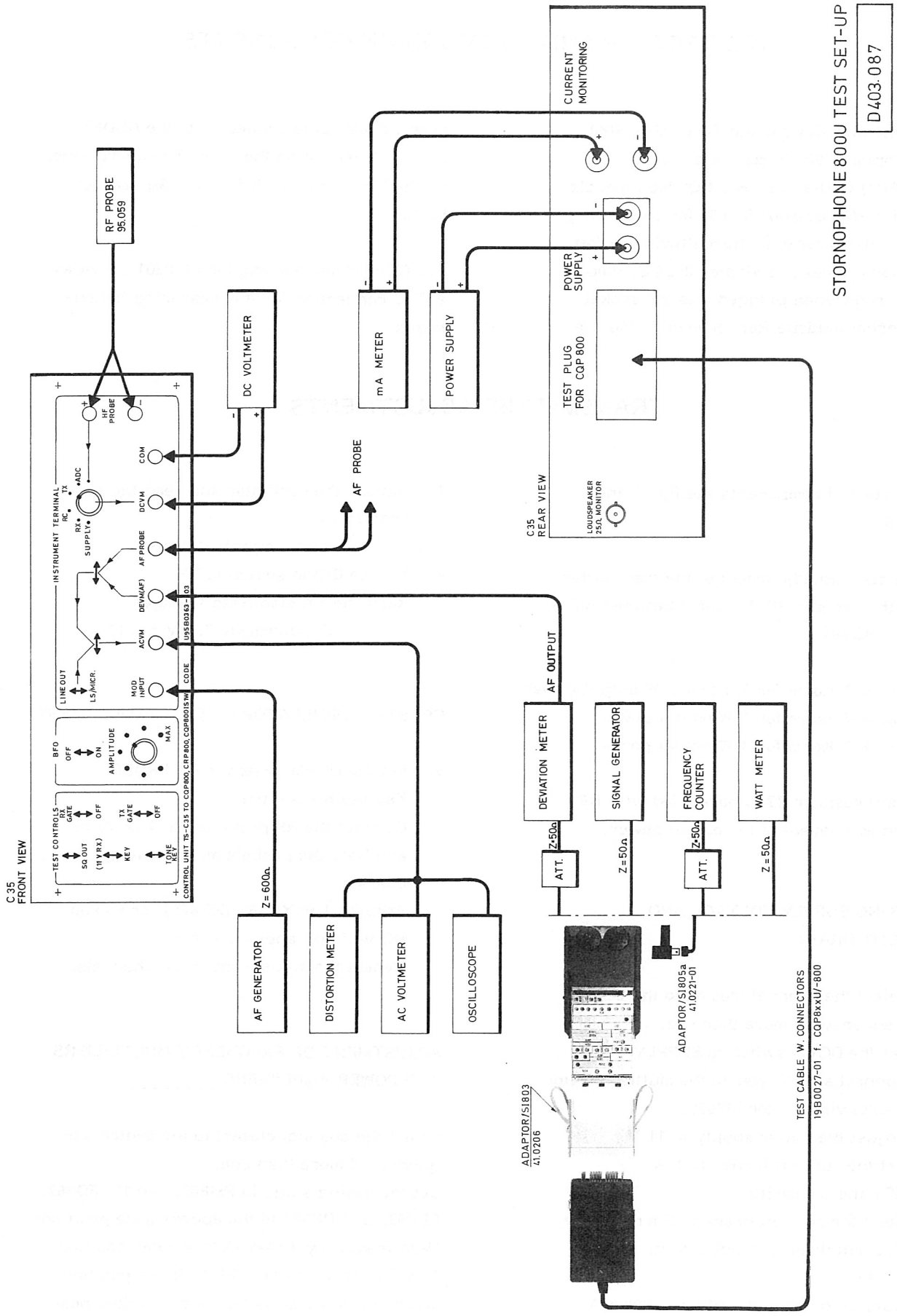


Fig. 2. TEST SET-UP

TEST SET-UP AND LOCATION OF COMPONENTS

The Control Unit C35, the Test Cable SI801, and Adaptor SI803 is connected to the CQP800(U) under test. For CQP800U models is used a BNC adaptor SI805a for connecting various instruments to the multiwire socket. This SI805a adaptor switches the CQP800U to remote mode when plugged into the socket. An external loudspeaker for monitoring the receiver signal is connected to the AUDIO MONITOR output on the rear. The microswitch on the SI805a is the LS in/out - Sq. cancel button.

For CQP800 models adaptor 41.0201 provides a BNC connection for the measuring instruments.

TRANSMITTER ADJUSTMENTS

For location of components see fig. 3 and fig. 7/8.

Before starting adjustment of the transmitter, check the resistor (R6) located between pin 4 and 6 of AD801.

approx. 6.8 Kohm for 0.1 to 0.5 W output power
approx. 4.7 Kohm for 1 W output power
approx. 2.7 Kohm for 3 W output power

A second resistor R7 is paralleled with R6 for fine adjustment of the output power.

CHECKING SUPPLY VOLTAGE AND CURRENT DRAIN

1. Select the channel closest to the center frequency, if more than one.
   Set the DCVM switch to SUPPLY.
   Connect a wattmeter to the multiconnector socket via adaptor SI805a.
   Adjust the power supply to 11 V.
   Set the current limiter to 1 A.
2. KEY the transmitter.
   Read the current drain on the mA meter.
   Current drain without output: approx. 70 mA.
   Current drain with output: <800 mA.
3. Unplug the oscillator and read the current drain.
   Requirement: <75 mA.
4. Set the DCVM switch to TX.
   Read the TX stabilized voltage.
   Requirement: 7.5 V ±0.15 V.

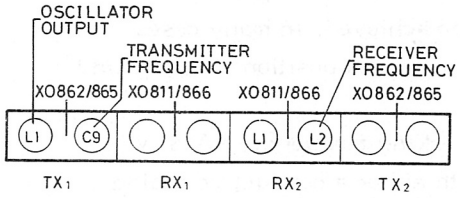
CRYSTAL OSCILLATOR OUTPUT ADJUSTMENT

5. Set the DCVM switch to RF PROBE.
   Key the transmitter.
   Connect the RF probe to pin 2 on PM861 and hold the probe's metal housing against chassis.
   Adjust L1 in XO862 (XO865) for maximum DC voltage, approx. 0.8 V.
   Repeat the adjustment on all channels.

ADJUSTMENT OF FREQUENCY MULTIPLIERS AND POWER AMPLIFIERS

Select the channel closest to the center frequency, if more than one.
Set the tuning slugs in PM862, FD861, FD862, FD863, and BP861 to the approximate position:
High frequency (>445 MHz)= outer position
Low frequency (<445 MHz)= inner position
Medium frequency (~445 MHz)= middle position.
KEY the transmitter.

LOCATION OF OSCILLATORS



2 CHANNELS (CH803)

1	2	3	4	TX OSCILLATORS
1	2	3	4	RX OSCILLATORS

4 CHANNELS (CH804)

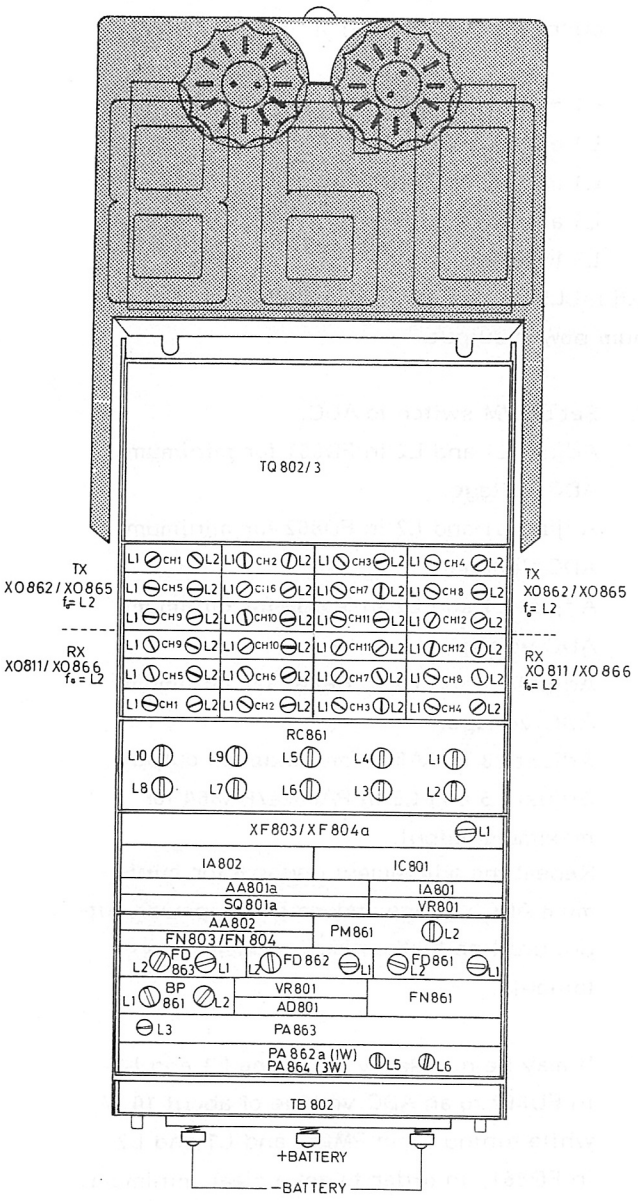
1	2	3	4	
5	6	7	8	TX OSCILLATORS
5	6	7	8	RX OSCILLATORS
1	2	3	4	

8 CHANNELS (CH 805)

1	2	3	4	
5	6	7	8	
9	10	11	12	TX OSCILLATORS
9	10	11	12	RX OSCILLATORS
5	6	7	8	
1	2	3	4	OSCILLATOR CQP863U/CQP864U

12 CHANNELS (CH806)

D403.094



ADJUSTABLE COMPONENTS CQP863U/ CQP864U

D403.095

Fig. 3. MODULE LOCATION

6. Adjust the following coils for maximum current drain as seen on the mA meter.

   L1 and L2 in FD861.
   L1 and L2 in FD862.
   L1 and L2 in FD863.
   L1 and L2 in BP861.
   L3 in PA863

Adjust L5 and L6 in PA862a/PA864 for maximum power output.

7. Set DCVM switch to ADC.
   Adjust L1 and L2 in FD861 for minimum ADC voltage.
   Adjust L1 and L2 in FD862 for minimum ADC voltage.
   Adjust L1 and L2 in FD863 for minimum ADC voltage.
   Adjust L1 and L2 in BP861 for minimum ADC voltage.
   Adjust L3 in PA863 for maximum output.
   Adjust L5 and L6 in PA862a/PA864 for maximum output.
   Repeat the adjustment under 6 for minimum ADC voltage and maximum power output until no further improvement is obtainable.

   It may be necessary to detune L1 and L2 in FD862 to an ADC voltage of about 10 V while tuning L3 in PM862 and L1 and L2 in FD861, in order to get a clear minimum.

8. The output power level can be adjusted by connecting a resistor, R7, in parallel with R6 (see fig. 7/8.).
   The value of R7 is chosen from the standard resistance series (0.1 W) as follows:

Power (nominal)	Select R7 for total current (mA)	Power (W) ±1 dB
0.5	220 +20/-0	0.5
1.0	380 +40/-0	1.0
3.0	750 +50/-0	3.0

   The current adjustment must be made with the power stages fine tuned for maximum output.
   Check the output power on all channels.

9. Read the ADC voltage.
   Requirement: $\leq$10 V.
   Typical ADC voltage at 1 W: 5 V.

APPENDIX FOR CQP864U

PA863 and PA862a/PA864 are principally broadband tuned power amplifier stages. However, to increase efficiency in certain parts of the frequency band coils L3, L5 and L6 are provided with tuning slugs. These should be adjusted for optimum power output where improvement can be achieved. In many cases the minimum or maximum position will be found to be optimum.
Depending on working frequency, PA863 will be furnished with either a conductive tuning slug (65.0026-00) or a ferrite tuning core (65.0025-00).

TRANSMITTER FREQUENCY ADJUSTMENT

10. Connect a frequency counter through an attenuator to the antenna connector.
    Key the transmitter.
    Adjust L2 in XO862 (XO865) to the channel frequency.
    Repeat the adjustment on all channels.
    Requirement at 25°C:
    $\pm 0.5 \times 10^{-6}$ (20-25 kHz channels spacing).
    $\pm 0.2 \times 10^{-6}$ (12.5 kHz channel spacing).

CHECKING AND ADJUSTMENT OF MODULATOR

11. Connect the deviation meter through an attenuator to the antenna connector.
    Set the DEVM (AF) - AF PROBE switch to DEVM (AF).

Set the ACVM switch to DEVM (AF).
Short circuit resistor combination R10/R11 (see fig. 7/8)
KEY the transmitter.
Set the AF generator to 1000 Hz and adjust the output level for approx. ±3 kHz transmitter frequency deviation.
The output should be below clipping level as seen at the AF output at the deviation meter.
Adjust L2 in PM862 for minimum distortion.
Remove the short circuit across R10/R11.

12. Set the tone generator output to 12 mV (12.5 kHz).
Set the tone generator output to 6 mV (20-25 kHz).
Check that Δf max. is not exceeded at frequencies between 300 Hz and 3000 Hz/2400 Hz (12.5 kHz).
If necessary adjust R11/R10.
Set the tone generator output to
0.7 x Δf max. at 1000 Hz.
±3.5 kHz for 25 kHz channel spacing.
±2.8 kHz for 20 kHz channel spacing.
±1.75 kHz for 12.5 kHz channel spacing.
Check the total Harmonic distortion on the output of the deviation meter.
Requirement: THD <7% (without de-emphasis).

RECEIVER ADJUSTMENT

For location of components see fig. 3 and fig. 7/8.

SUPPLY VOLTAGE AND CURRENT DRAIN

Before making adjustments to the receiver circuits check the discriminator bandwidth resistor between pin 1 and pin 3 of IA802.
CQP863-R1= 5.6 Kohm
CQP864-R1= 27 Kohm
Apply 5.0 V to terminal 8 of FC804 (CQP864 only)

1. Set the DCVM switch to SUPPLY.
Adjust the power supply to 11 V.
Set the current limiter to 0.1 A.
2. Read the current drain.
I_{total}: <100 mA
3. Set the DCVM switch to RX.
Read the stabilized RX voltage.
Requirement: 7.5 V ±0.15 V.

ADJUSTMENT OF RECEIVER CONVERTER

4. Set the trimming slugs of L1, L2, L3, L4, L5 and L6 in RC861 to the outer position.
Set the slug in L7, L8, L9, and L10 to the middle position.

CRYSTAL OSCILLATOR OUTPUT ADJUSTMENT

Procedure for XO811:
Crystal oscillator XO811 is factory adjusted for maximum output into 50 ohm, and output coil L1 is normally not to be touched.
If the oscillator has been detuned disconnect coaxial cable from XO811 to RC861 at RC861 (terminal 9) and terminate it with a 47 ohm resistor.
Set the DCVM switch to RF PROBE. Tune L1 in XO811 to maximum output as measured with the RF probe connected across the 47 ohm resistor.

Procedure for XO866:
Crystal oscillator XO866 is factory adjusted for maximum output into 50 ohm, and output coil L1 is normally not to be touched.
If the oscillator has been detuned disconnect FC804 (terminal 2) from RC861 (terminal 7) and terminate FC804 with a 47 ohm resistor.
Set the DCVM switch to RF PROBE.
Tune L1 in XO866 to maximum output as measured with the RF probe connected across the 47 ohm resistor.

For both:
Repeat the adjustment on all channels.
Set the DCVM switch to RC.
NOTE: The helix circuits are sensitive to the adjustment tool. Remove the tool before measuring the result of turning slugs.

Set the channel selector to the channel closest to the center frequency, if more than one.
Adjust L10 in RC861 for maximum DC voltage.
Adjust L9 in RC861 for maximum DC voltage.
Adjust L7 in RC861 for maximum DC voltage.
Set the RX gate switch to OFF to disable the receiver oscillator; the DC voltage should fall at least 0.1 V.
After the check switch the RX gate ON again.

5. Set the signal generator to the receiver frequency.
Modulate the generator with 1 kHz to a frequency deviation of 0.7 x Δf max.
±3.5 kHz for 25 kHz channel spacing.
±2.8 kHz for 20 kHz channel spacing.
±1.75 kHz for 12.5 kHz channel spacing.

Set SQ OUT switch down.
Set LINE OUT - LS/MICR down.
Set ACVM switch to LS/MICR.

Turn the volume switch to the 2nd position (II) (approx. 0.5 V on the ACVM, no clipping).
Adjust the signal generator output to 12 dB SINAD.

As the receiver sensitivity increases during the adjustment, the signal generator output must be reduced to maintain 12 dB SINAD.
Adjust L8 in RC861 for best signal to noise ratio at approx. 12 dB SINAD.
Adjust L7 in RC861 for best signal to noise ratio at approx. 12 dB SINAD.
Adjust L5 in RC861 for best signal to noise ratio at approx. 12 dB SINAD.
This is the ONLY adjustment of L5.

The following coils are adjusted for best signal to noise ratio in this order:
L6, RC861
L4, RC861
L3, RC861
L1, RC861
L2, RC861
L1, RC861
L3, RC861
L4, RC861
Readjust L7 in RC861 for best signal to noise ratio.
Adjust L6 in RC861 for best signal to noise ratio.
Adjust L9 in RC861 for maximum DC voltage (2-3 V).

6. Set the signal generator output to approx. 100 uV e.m.f.
Adjust L8 in RC861 and L1 in XF803 (XF804a) for minimum distortion.

MEASURING RECEIVER FREQUENCY

OSCILLATOR FREQUENCY ADJUSTMENT

7. Set the generator to the receiver frequency using the frequency counter.
Remove the signal generator modulation and set the output to 100 uV e.m.f.
Turn the BFO on.
Adjust BFO AMPLITUDE to produce a clear beat tone.
Set ACVM switch to LINE OUT.
Adjust L2 in XO811 (XO866) for zero beat as seen on the oscilloscope.
If more than one channel is provided the adjustment should be repeated on all channels. When adjustments are completed, turn the BFO OFF.

RECEIVER SENSITIVITY MEASUREMENT

EIA (Electronic Industrie's Association) standard, definition:
The SINAD sensitivity of a receiver is the minimum input signal that will provide at least 50% of the receiver's rated audio output power with 12 dB signal + noise + distortion + distortion.

METHOD OF MEASUREMENT

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

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

The second condition is the one where the signal (modulation) is removed with a notch filter and the RF-signal is lowered in amplitude until the remaining noise and distortion increases to 12 dB below the first condition, as read on the distortion meter scale. This corresponds to a reading of 25% being 12 dB below 100, which was our reference condition. (100 -6 dB= 50, 50 - 6 dB= 25%).

In practice our first condition is achieved by feeding a minimum of 1000 uV of RF-signal modulated with 1000 Hz at 0.7 x Δf max. to the receiver. The audio output (which must be at least 50% of the receiver's audio rating) is measured with the distortion meter in position CAL and adjusted with potentiometer ADJ, FSD, to a reading of 100.

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

By backing off the attenuator of the RF-generator, thereby lowering the RF-input to the receiver, the noise will eventually increase; the attenuator being adjusted for a reading on the distortion meter scale of 25%.

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

The RF-generator's calibrated attenuator now shows the value of RF-signal required to achieve a 12 dB ratio between signal + noise + distortion and noise + distortion, i.e. 12 dB SINAD sensitivity.

MEASURING RECEIVER SENSITIVITY

8. The sensitivity must be minimum 1.0 uV e.m.f.
   Typical value: 0.7 uV e.m.f.
   Changing the supply voltage from 9.6 V to 13.5 V should not influence on the sensitivity obtained at 11 V.
   If more than one channel is provided, the sensitivity check should be repeated on all channels.

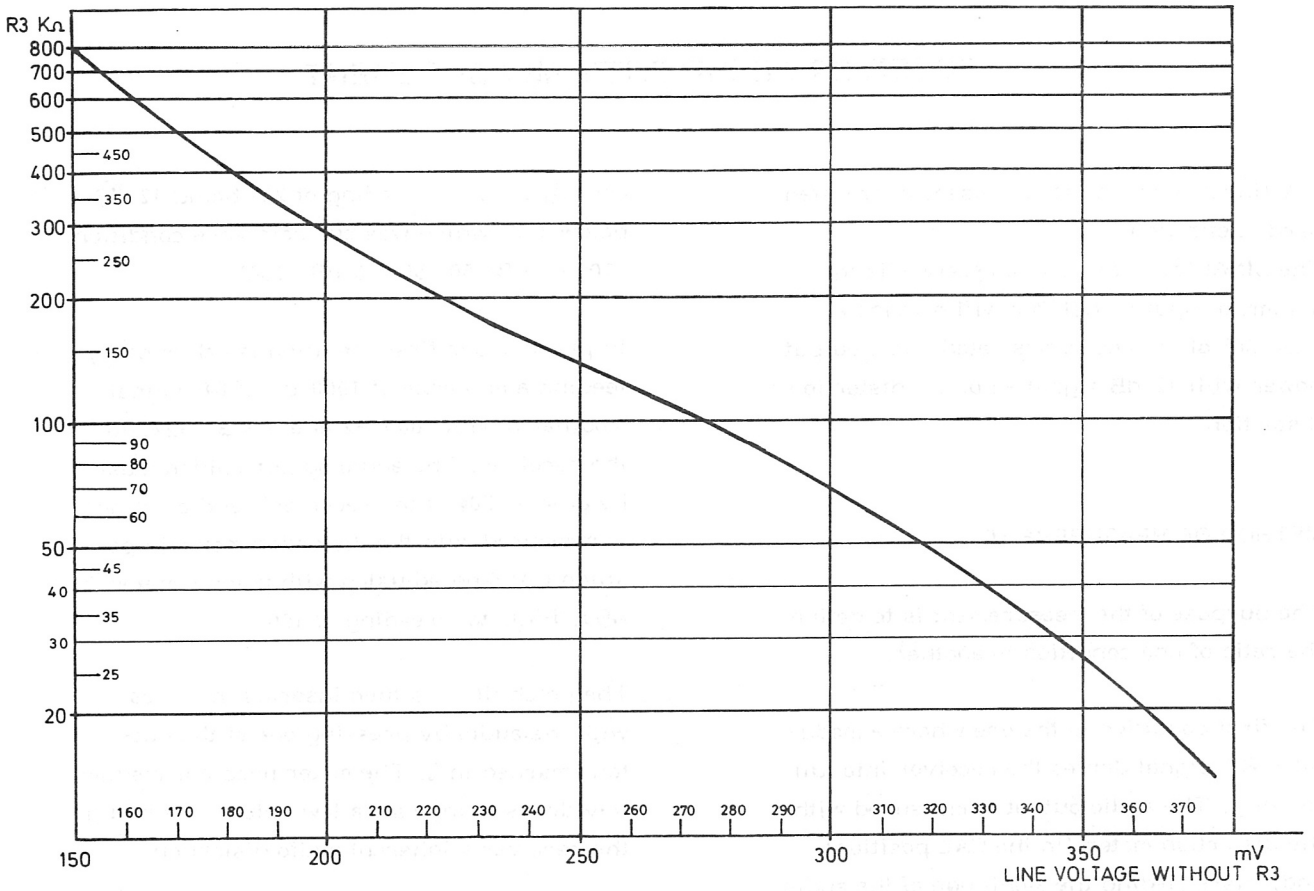


Fig. 4. ADJUSTMENT OF RESISTOR R 3

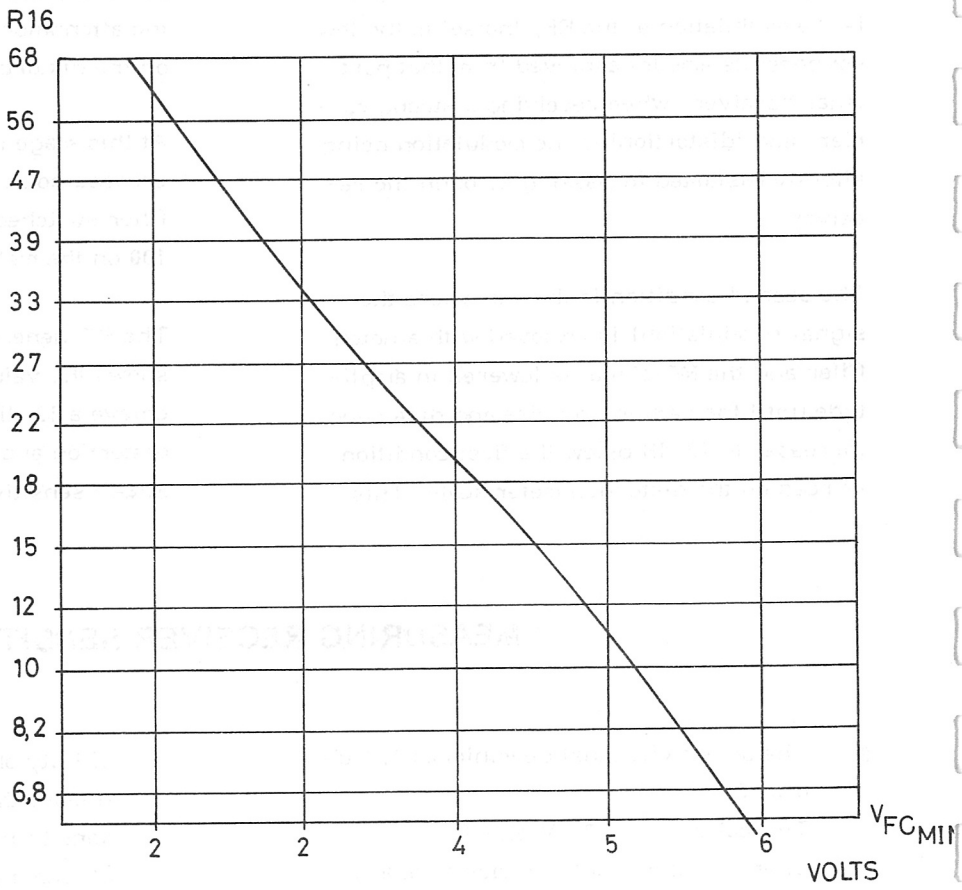


Fig. 5. ADJUSTMENT OF RESISTOR R16

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MEASURING AND SETTING RECEIVER AUDIO LEVEL

CHECKING RECEIVER AUDIO LINE OUTPUT

9. Modulate the signal generator with 1 kHz and 0.7 x Δf max.
   ±3.5 kHz for 25 kHz channel spacing
   ±2.8 kHz for 20 kHz channel spacing
   ±1.75 kHz for 12.5 kHz channel spacing
   Set the signal generator output to 100 uV e.m.f.
   Switch the ACVM to LINE OUT.
   Read the AF Line voltage (-17 dBm).
   Requirement: 110 mV +0/-1 dB.
   If necessary change resistor value (R3) in parallel with R2 (IA802, pin 5 - 6) until 110 mV is obtained.

   The graph (fig. 4) indicates the value of the resistor, which should be the closest higher standard value.

CHECKING THE AF FREQUENCY RESPONSE AND DISTORTION

10. Set the signal generator output to approx. 100 uV e.m.f.
    Set LINE OUT - LS/MICR switch down.
    Turn the volume switch to the 3rd position (III).
    Read the AF voltage on the ACVM (reference).

    Set the modulation frequency to 300 Hz (12.5-20-25 kHz).
    AF voltage: +9 dB ±2 dB rel. to 1000 Hz.
    Set the modulation frequency to 3000 Hz (20-25 kHz).
    AF voltage: -10 dB ±2 dB rel. to 1000 Hz.
    Set the modulation frequency to 2500 Hz (12.5 kHz).
    AF voltage -9 ±2 dB rel. to 1000 Hz.

11. Turn the volume switch to the 4th position (IIII).
    Check the total harmonic distortion (THD) at 1000 Hz.
    Requirement: THD= <7%

ADJUSTMENT AND CHECKING OF THE SQUELCH FUNCTION

12. Set the volume to the 4th position (IIII).
    Set the SQ OUT switch up.
    Increase the RF-generator output until the signal opens the squelch.
    Requirement: 10 to 12 dB SINAD.

    Decrease the value of R4 if SINAD is less than 10 dB.
    Increase the value of R4 if SINAD is more than 12 dB.

CHECKING THE OVERALL RECEIVER CURRENT DRAIN

13. Set the DCVM switch to SUPPLY.
    Set the supply voltage to 11 V.
    Disconnect the signal generator.

    Read the current drain on the mA meter.
    Requirement: <9.5 mA + current drain of tone equipment (20-25 kHz).
    11 mA + current drain of tone equipment (12.5 kHz).
    Set the SQ OUT switch down.
    Set the volume switch to the 4th position (IIII).

    Read the current drain on the mA meter.
    Requirement: <100 mA.

ADJUSTMENT AND CHECKING THE FC804
(only for 12.5 kHz channel spacing)

14. Adjust the receiving frequency +1.2 kHz on one of the channels. (RF level 1 mV e.m.f.)
Apply 7.1 V to terminal 8 of FC804.
Adjust oscillator XO866 to signal generator frequency by means of zero beat with 21.4 MHz.
Then adjust the signal generator frequency to receiving frequency -1.2 kHz.
Lower the voltage at terminal 8 until the oscillator frequency produces zero beat with 21.4 MHz.
This voltage is V_{FC} min.
Resistor R16 can then be determined.

Select the closest standard value and solder it to FC804 between terminal 7 and terminal 8.
Adjust the signal generator frequency to the receiving frequency.
Adjust the voltage V_{FCO} at terminal 8 of FC804 for zero beat with 21.4 MHz.
If it is not possible to select a resistance value for R14 so that the voltage is V_{FCO} ±0.1 V, it is necessary to use one more resistor, R15, in parallel with the other.

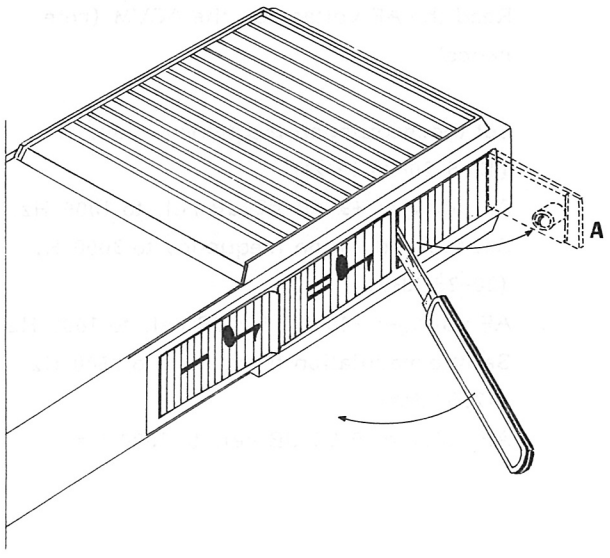
FINAL ADJUSTMENT OF OSCILLATOR FREQUENCY

15. Connect the power supply (0-10 V) to terminal 8 of FC804 and apply V_{FCO} volts.
Then adjust all channels as described in paragraph 8.
NOTE: It is not possible to adjust the receiver oscillators by means of the zero beat method when FC804 is active.
Disconnect the power supply from FC804 and connect a volt-meter instead.
Connect the resistor box (95B0470) to terminal 5 and terminal 6 of FC804.
Select the smallest resistor which causes the voltage to rise above V_{FCO}.
Solder a resistor R13 which is one step higher to FC804 between terminal 5 and 6.
By means of the resistor box select resistor R14 which causes the voltage to be closest to V_{FCO} and solder it to FC804 in parallel with R13.

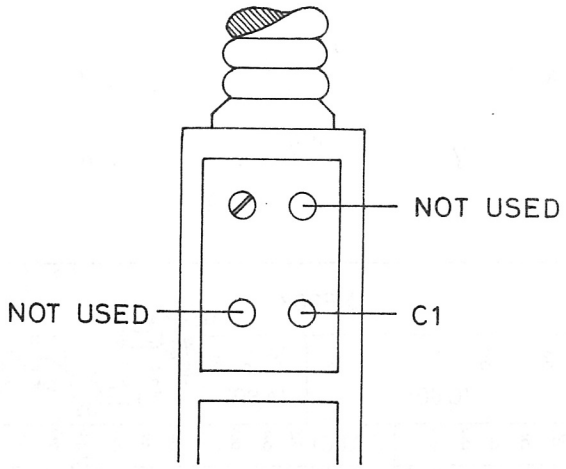
ANTENNA MATCHING ADJUSTMENT

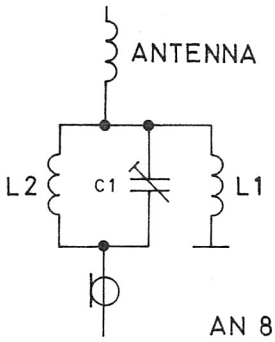
ANTENNA NETWORK ADJUSTMENT IN CP808, LOCAL MODE

1. Assemble the radio set with cabinet sheath and loudspeaker panel in position.
2. Screw antenna AN864 or AN865 in position.
3. Clip antenna alignment unit TS-D37, code 95B0555, in remote control multiplug on CP808.
4. Raise hinged cover "A" on control head CP808 and remove rubber gasket, thus giving access to the matching network's variable components.



5. Power equipment by means of a battery (f. ex. BU807) and hold in normal operating position.
   Key transmitter.
6. Adjust C1 for maximum indication on TS-D37.
7. This completes the antenna network adjustment. Replace gasket and snap cover "A" back into position.





AN 864 AND AN 865
MATCHING NETWORK

Fig. 6. ANTENNA MATCHING NETWORK IN CP808

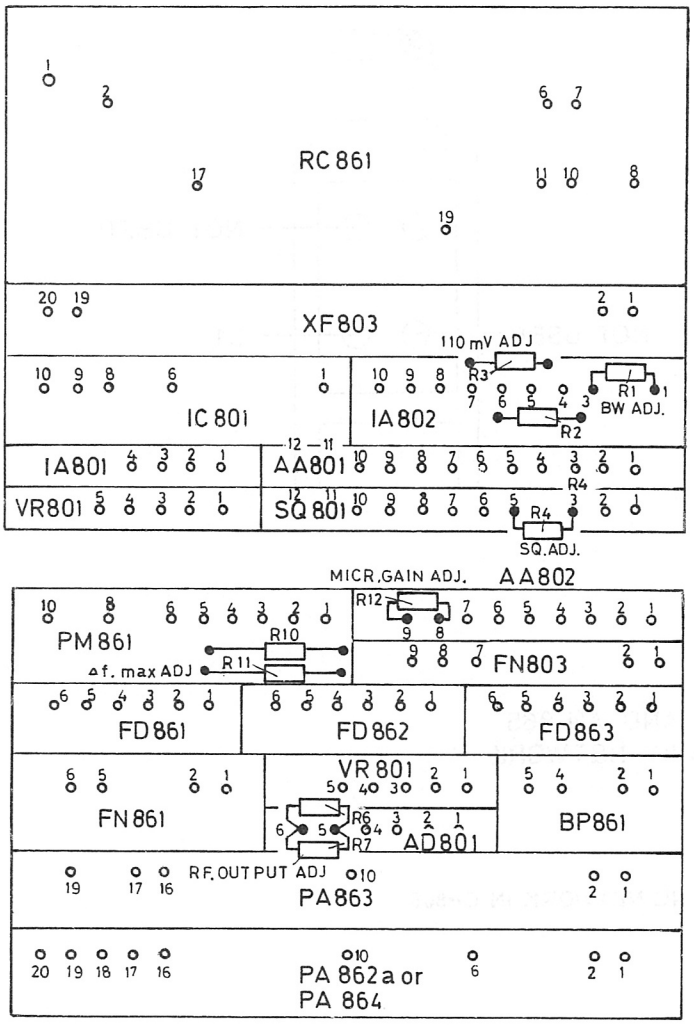


Fig. 7. TERMINAL LAYOUT CQP863U

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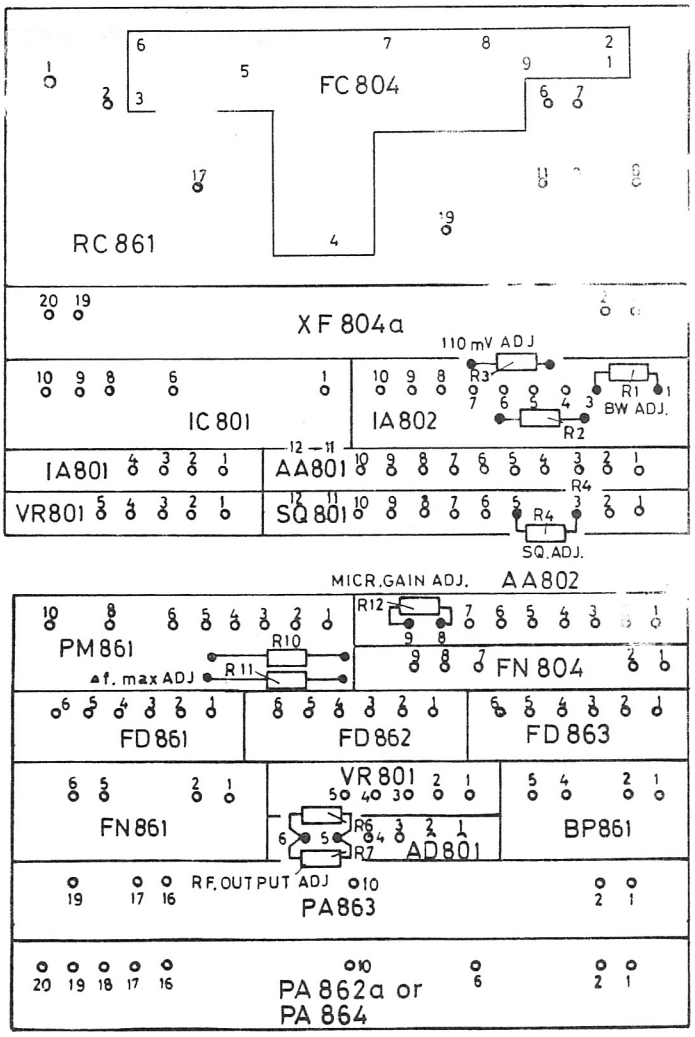

Fig. 8. TERMINAL LAYOUT CQP864U

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TRANSMITTER ADJUSTMENT

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CQP863U/CQP864U

	TEST	ADJUST	INSTRUMENT	READING
1	Supply voltage	Power supply	Voltmeter	11 V
2	Current drain		mA meter	70 - 800 mA
3	Current drain without oscillator		mA meter	<70 mA
4	+7.5 V TX		Voltmeter	+7.5 V ±0.15%
5	Oscillator output	XO862 - L1 or XO865 - L1	95.059 + VM	maximum
6	Current drain	FD861 - L1, L2 FD862 - L1, L2 FD863 - L1, L2 BP861 - L1, L2 PA863 - L3	mA meter	maximum
7	Power output ADC voltage	FD861 - L1, L3 FD822 - L1, L2 FD863 - L1, L2 BP861 - L1, L2 PA863 - L3 PA862a - L5, L6 or PA864 - L5, L6	Voltmeter Wattmeter	minimum ADC voltage <10 V 0.1 - 1W } maximum power 1 - 3 W } output
8	Current drain		mA meter	approx. 0.5 W - <240 mA approx. 1 W - <420 mA approx. 3 W - <800 mA
9	Frequency	XO861 - L2 or XO865 - L2	Frequency counter	f_{ant} ±0.5 x 10^{-6} (20 - 25 kHz) f_{ant} ±0.2 x 10^{-6} (12.5 kHz)
10	Modulation	PM861 - L2	AF generator Deviation meter Distortion meter	minimum distortion
11	6 mV AF input Modulation distortion	R11 - R10	AF generator Deviation meter Distortion meter	0.7 x Δf max., f mod= 1 kHz THD= <7%
12	Antenna network	C1	TS-D37 code 95B0555	Maximum indication

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RECEIVER ADJUSTMENT

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CQP863U/CQP864U

	TEST	ADJUST	INSTRUMENT	READING
1	Supply voltage	Power supply	DC voltmeter	11 V
2	+7.5 V RX	Check	Voltmeter	+7.5 V ±0.15%
3	Current drain	Check	mA meter	<100 mA
4	RC test point without oscillator	RC861 - L10, L9, L7	DC voltmeter	maximum (1.7 V) -0.1 V
5	Receiver sensitivity	RC861 - L8, L7 L3, L4	RF generator Distortion meter	minimum distortion
		L6, L9	DC voltmeter Distortion meter	maximum minimum
6		RC861 - L8 XF804a - L1 or XF804a - L1	RF generator high output	minimum distortion
7	Sensitivity	Check		12 dB SINAD <1.0 uV e.m.f.
8	Frequency	XO811 - L2 or XO866 - L2	RF generator 21.4 MHz BFO oscilloscope	zero beat
9	AF Line output	IA802 (R3)	RF generator (high output) AC voltmeter	110 mV AF
10	AF response	Volume to 3rd position (III)	RF generator (high output) AC voltmeter	300 Hz: +9 ±2 dB 1000 Hz: 0 dB 3000 Hz: (20-25 kHz) -10 ±2 dB 2500 Hz: (12.5 kHz) -9 ±2 dB
11	Distortion	Check	Distortion meter	THD= <7%
12	Squelch	R4	RF generator	opens at 10 - 12 dB SINAD
13	Current drain	Volume to pos. 4 (IIII)	mA meter	no signal, Sq. off <9.5 mA (20-25 kHz) <11 mA (12.5 kHz) no signal, SQ. on <100 mA
14	Frequency control	R16 R13, R14, R15	RF Generator Voltmeter Power supply	V_{CF} min V_{FCO} ±0.1 V ±1.2 kHz
15	Frequency	XO866	RF generator 21.4 MHz BFO Oscilloscope Power supply	Zero beat

	CABINET		CABLEFORMS KIT	OSCILLATOR	CHASSIS	RECEIVER	TRANSMITTER
	Type	Code No.	Code No.	Type	Code No.	MODULE CHASSIS	MODULE CHASSIS 1W + 3W
CQP 810U 1C8X2	CA 802-82	10.3600-16	18.0874-00	CH 803	10.2710-00	10.3228-00	10.3505-00
CQP 810U 1C8X4	CA 802-90	10.3600-18	18.0875-00	CH 804	10.2711-00	10.3228-00	10.3505-00
CQP 810U 1C8X8	CA 802-102	10.3600-21	18.0876-00	CH 805	10.2712-00	10.3228-00	10.3505-00
CQP 810U 1C8X12	CA 802-118	10.3600-25	18.0877-00	CH 806	10.2713-00	10.3228-00	10.3505-00
CQP 810U 1C8X2T	CA 802-122	10.3600-26	18.0878-00	CH 803	10.2710-00	10.3228-00	10.3505-00
CQP 810U 1C8X4T	CA 802-130	10.3600-28	18.0879-00	CH 804	10.2711-00	10.3228-00	10.3505-00
CQP 810U 1C8X8T	CA 802-142	10.3600-31	18.0880-00	CH 805	10.2712-00	10.3228-00	10.3505-00
CQP 810U 1C8X12T	CA 802-158	10.3600-35	18.0881-00	CH 806	10.2713-00	10.3228-00	10.3505-00
CQP 830U 1C8X2	CA 802-82	10.3600-16	18.0874-00	CH 803	10.2710-00	10.3228-00	10.3505-00
CQP 830U 1C8X4	CA 802-90	10.3600-18	18.0875-00	CH 804	10.2711-00	10.3228-00	10.3505-00
CQP 830U 1C8X8	CA 802-102	10.3600-21	18.0676-00	CH 805	10.2712-00	10.3228-00	10.3505-00
CQP 830U 1C8X12	CA 802-118	10.3600-25	18.0877-00	CH 806	10.2713-00	10.3228-00	10.3505-00
CQP 830U 1C8X2T	CA 802-122	10.3600-26	18.0878-00	CH 803	10.2710-00	10.3228-00	10.3505-00
CQP 830U 1C8X4T	CA 802-130	10.3600-28	18.0879-00	CH 804	10.2711-00	10.3228-00	10.3505-00
CQP 830U 1C8X8T	CA 802-142	10.3600-31	18.0880-00	CH 805	10.2712-00	10.3228-00	10.3505-00
CQP 830U 1C8X12T	CA 802-158	10.3600-35	18.0881-00	CH 806	10.2713-00	10.3228-00	10.3505-00
CQP 860U 1C8X2	CA 802-94	10.3600-19	18.0884-00	CH 803	10.2710-00	10.3230-00	10.3505-00
CQP 860U 1C8X4	CA 802-102	10.3600-21	18.0885-00	CH 804	10.2711-00	10.3230-00	10.3505-00
CQP 860U 1C8X8	CA 802-114	10.3600-24	18.0886-00	CH 805	10.2712-00	10.3230-00	10.3505-00
CQP 860U 1C8X12	CA 802-130	10.3600-28	18.0887-00	CH 806	10.2713-00	10.3230-00	10.3505-00
CQP 860U 1C8X2T	CA 802-134	10.3600-29	18.0888-00	CH 803	10.2710-00	10.3230-00	10.3505-00
CQP 860U 1C8X4T	CA 802-142	10.3600-31	18.0889-00	CH 804	10.2711-00	10.3230-00	10.3505-00
CQP 860U 1C8X8T	CA 802-154	10.3600-34	18.0890-00	CH 805	10.2712-00	10.3230-00	10.3505-00
CQP 860U 1C8X12T	CA 802-170	10.3600-38	18.0891-00	CH 806	10.2713-00	10.3230-00	10.3505-00

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TYPE	Nº	CODE	DATA
TX863	1W	10.3596	Transmitter unit 1.0W - 20/25kHz
TX863	3W	10.3597	Transmitter unit 3.0W - 20/24kHz
			Transmitter subunits
		10.2688	AA802 Modulation amplifier
		10.2691	AD801 ADC circuit
		10.2704	BP861 Band pass filter
		10.3505	CH8014 Chassis
		10.2701	FD861 Frequency doubler
		10.2702	FD862 Frequency doubler
		10.2703	FD863 Frequency doubler
		10.2694	FN803 Modulation filter
		10.2705	FN861 Antenna filter
		10.2707-01	PA862a Power amplifier
		10.3417	PA863 Power amplifier
		10.3418	PA864 Power amplifier
		10.2700	PM861 Phase modulator
		10.2690	VR801 Voltage regulator
RX863		10.3436	Receiver unit 20/25kHz
			Receiver subunits
		10.2687-01	AA801a Audio amplifier
		10.3230	CH8010 Chassis
		10.2685	IA801 IF amplifier
		10.2808	IA802 IF amplifier/detector
		10.2686	IC801 IF converter
		10.2699	RC861 Receiver converter
		10.2689-01	SQ801a Squelch circuit
		10.2690	VR801 Voltage regulator
		10.2692	XF803 Crystal filter

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TYPE	Nº	CODE	DATA	
			Components mounted on TX/RX	
	R1	80.5058	5.6k ohm 5% carbon film	1/0W
	R2	80.5081	470k ohm 5% carbon film	1/10W
	R3	80.50XX	Adj. 110mV	
	R4	80.50XX	Adj. Squelch	
	R6	80.5057	4.7k ohm 5% carbon film	1/10W
	R7	80.50XX	Adj. ADC	
	R10	80.50XX	Adj. Deviation	
	R11	80.50XX	Adj. Deviation	
	R12	80.5054	2.7k ohm 5% carbon film	1/10W
	C4	74.5275	470pF 20% ceram	
	C5	74.5275	470pF 20% ceram	
	C6	74.5275	470pF 20% ceram	
		10.3587	TB802 Terminal board	
	C1-C6	74.5277	1nF 20% ceram	50V
	Fb	65.5102	Ferrite bead	
	S1	92.5117	Fuse 2A	
		10.3375	CP808 Control head	
		10.2710	CH803 Chassis, 2 channels	
		10.2711	CH804 Chassis, 4 channels	
		10.2712	CH805 Chassis, 8 channels	
		10.2714	CH806 Chassis, 12 channels	
		10.2708	XO811 Receiver oscillator	
		10.2885	XO862 Transmitter oscillator	

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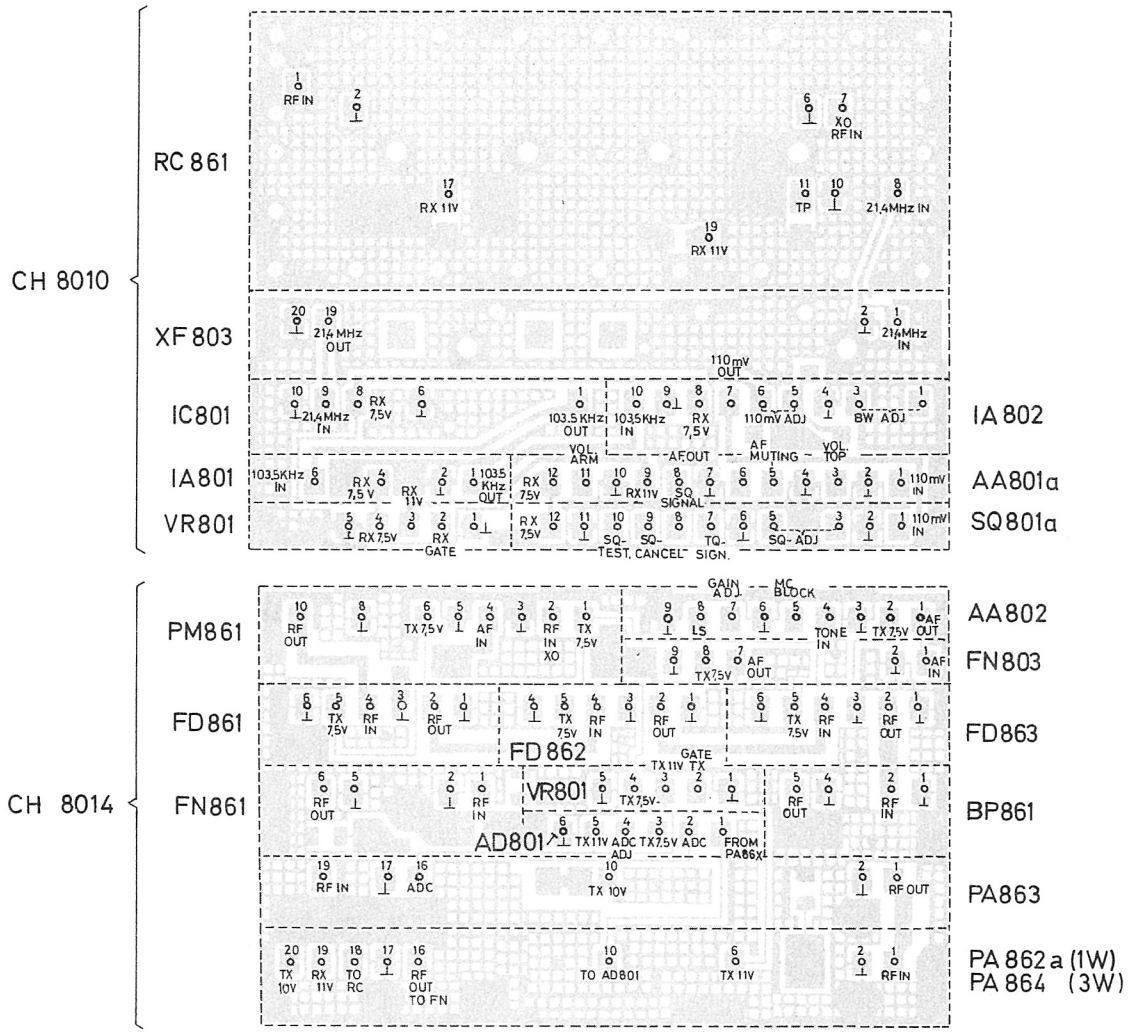
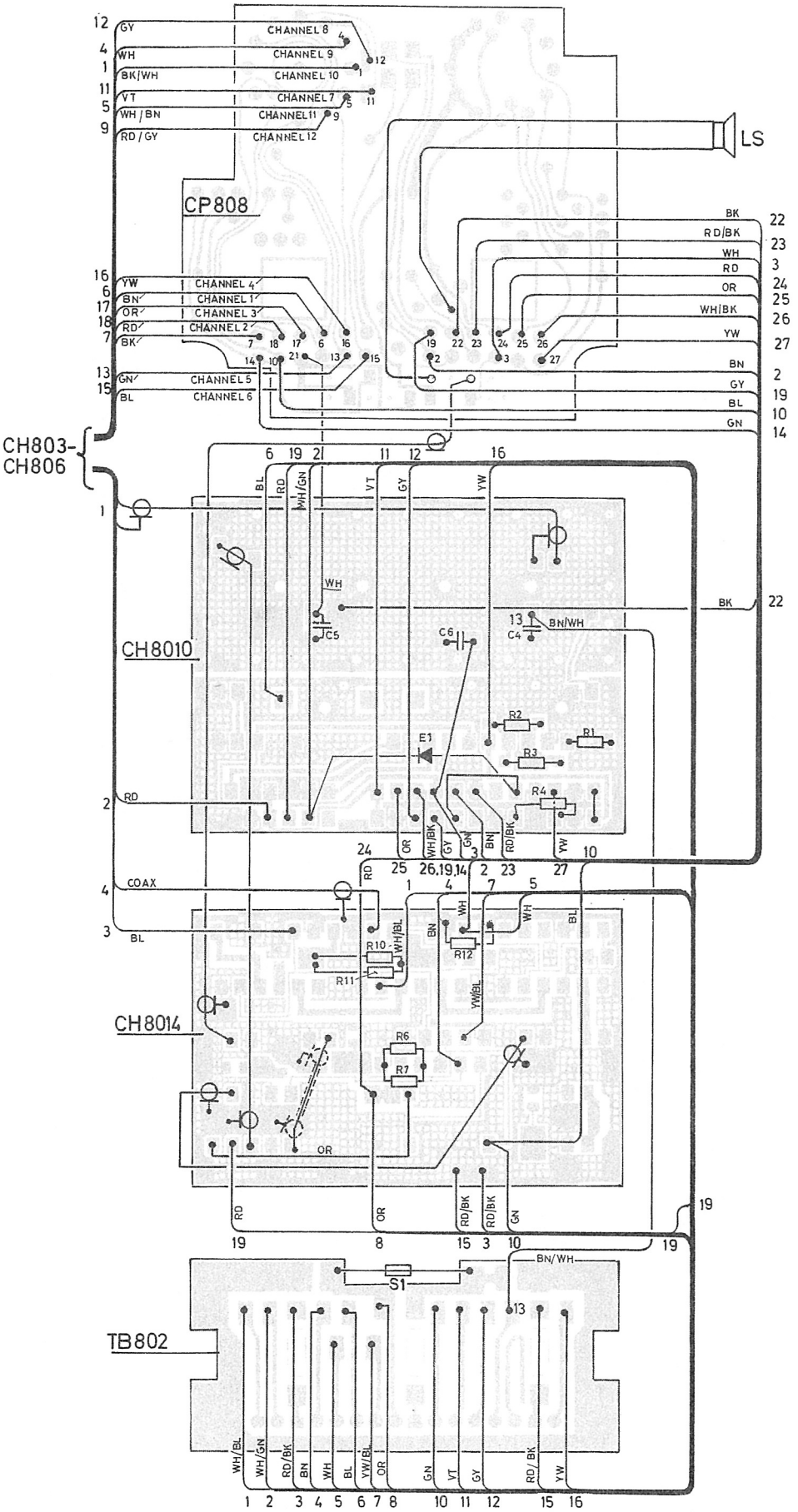


PIN LOCATION CQP860U

D402.474

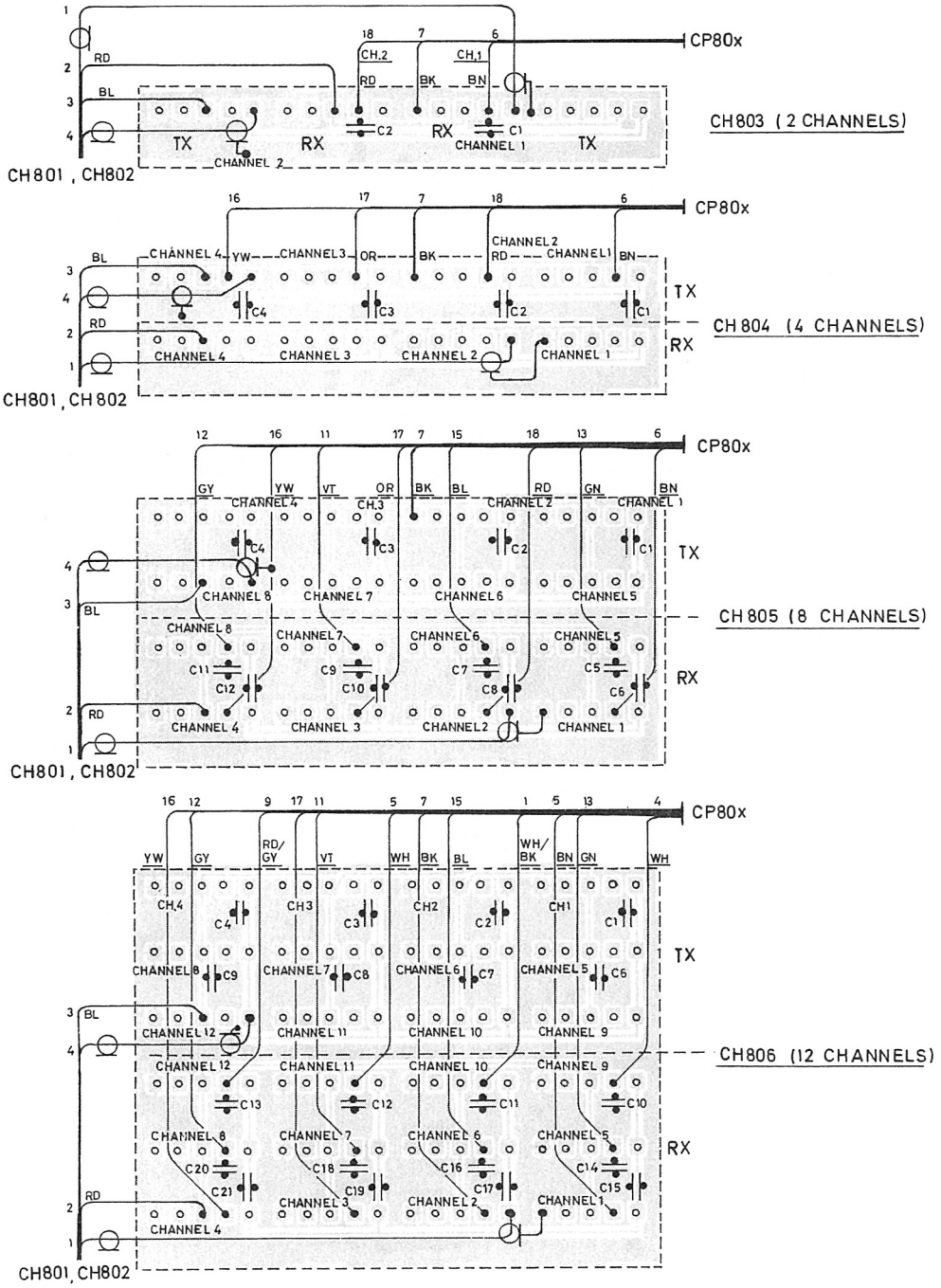
Storno



WIRING DIAGRAM CQP860U

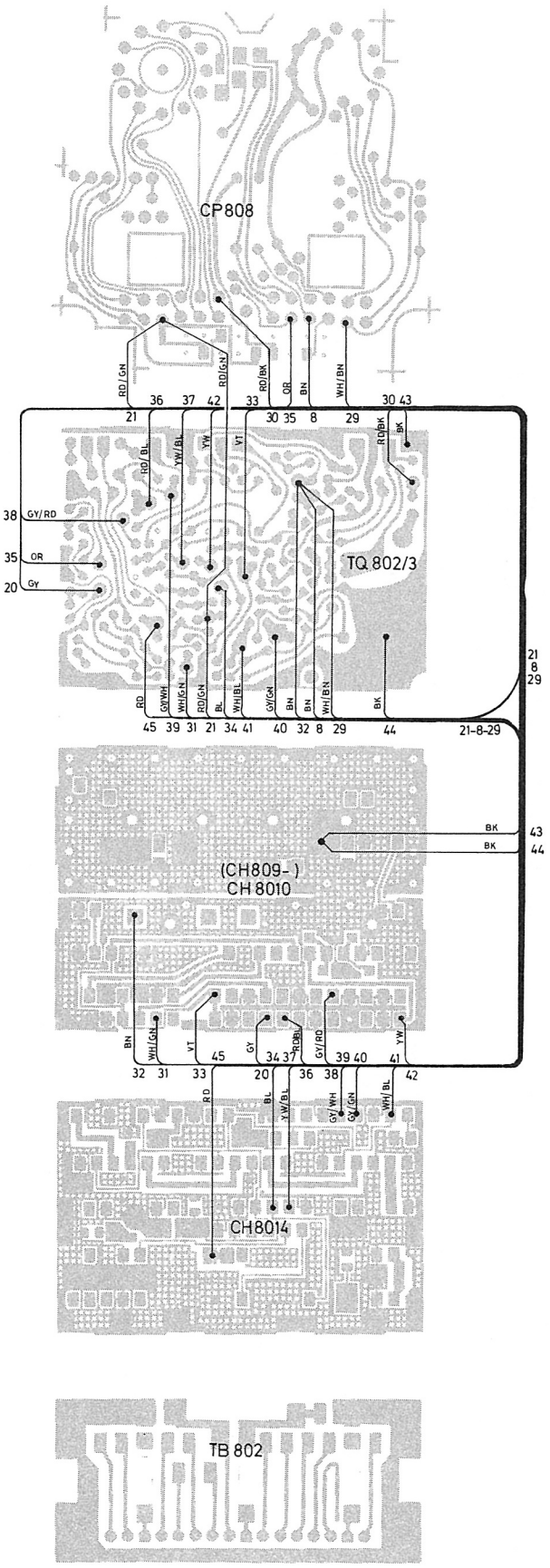
D402.470/3

Storno



WIRING DIAGRAM CH803, CH804, CH805, CH806

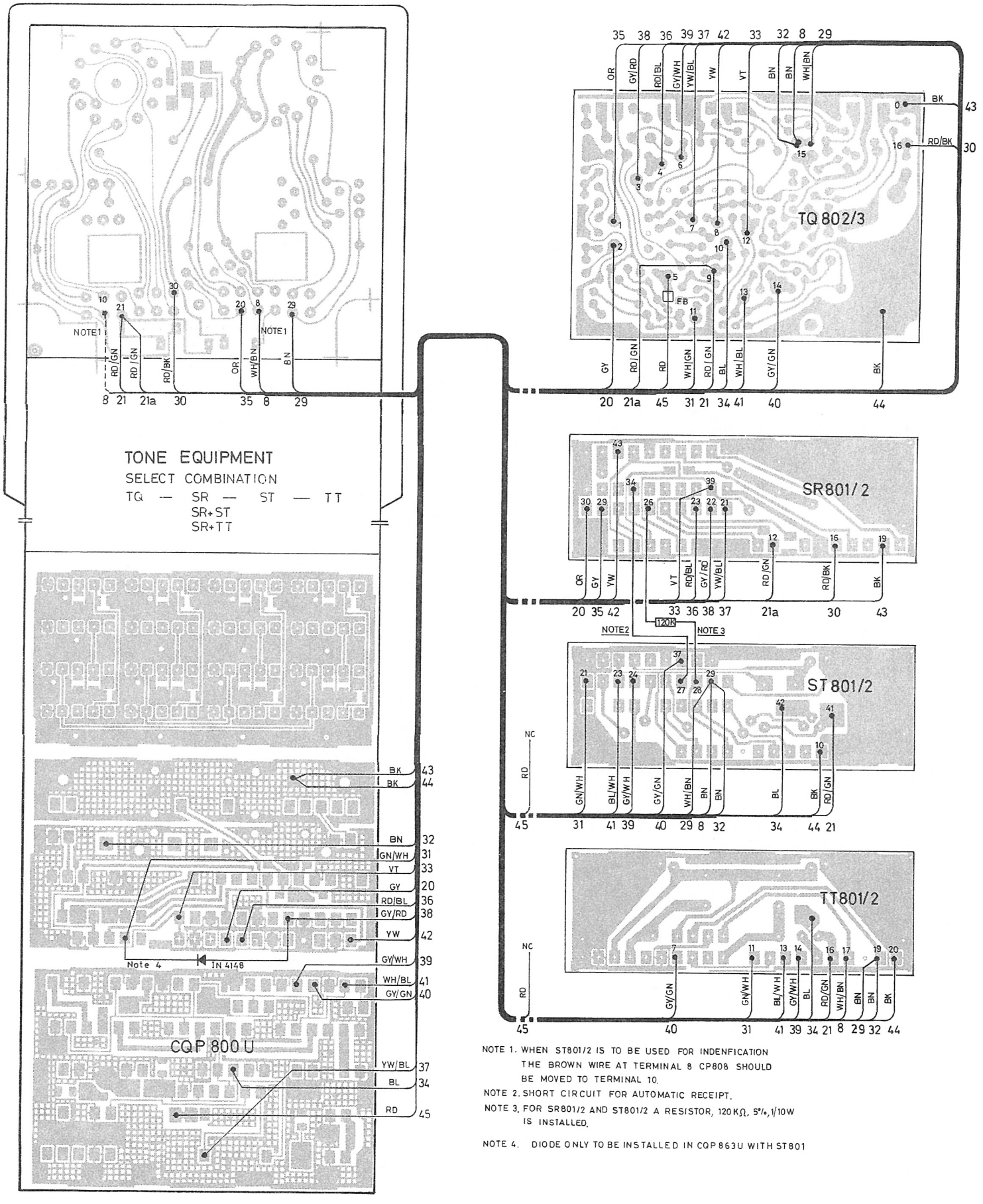
Storno



TONE EQUIPMENT WIRING DIAGRAM CQP800U

D402.472

Storno



NOTE 1. WHEN ST801/2 IS TO BE USED FOR INDENFICATION THE BROWN WIRE AT TERMINAL 8 CP808 SHOULD BE MOVED TO TERMINAL 10.

NOTE 2. SHORT CIRCUIT FOR AUTOMATIC RECEIPT.

NOTE 3. FOR SR801/2 AND ST801/2 A RESISTOR, 120 KΩ, 5%, 1/10W IS INSTALLED.

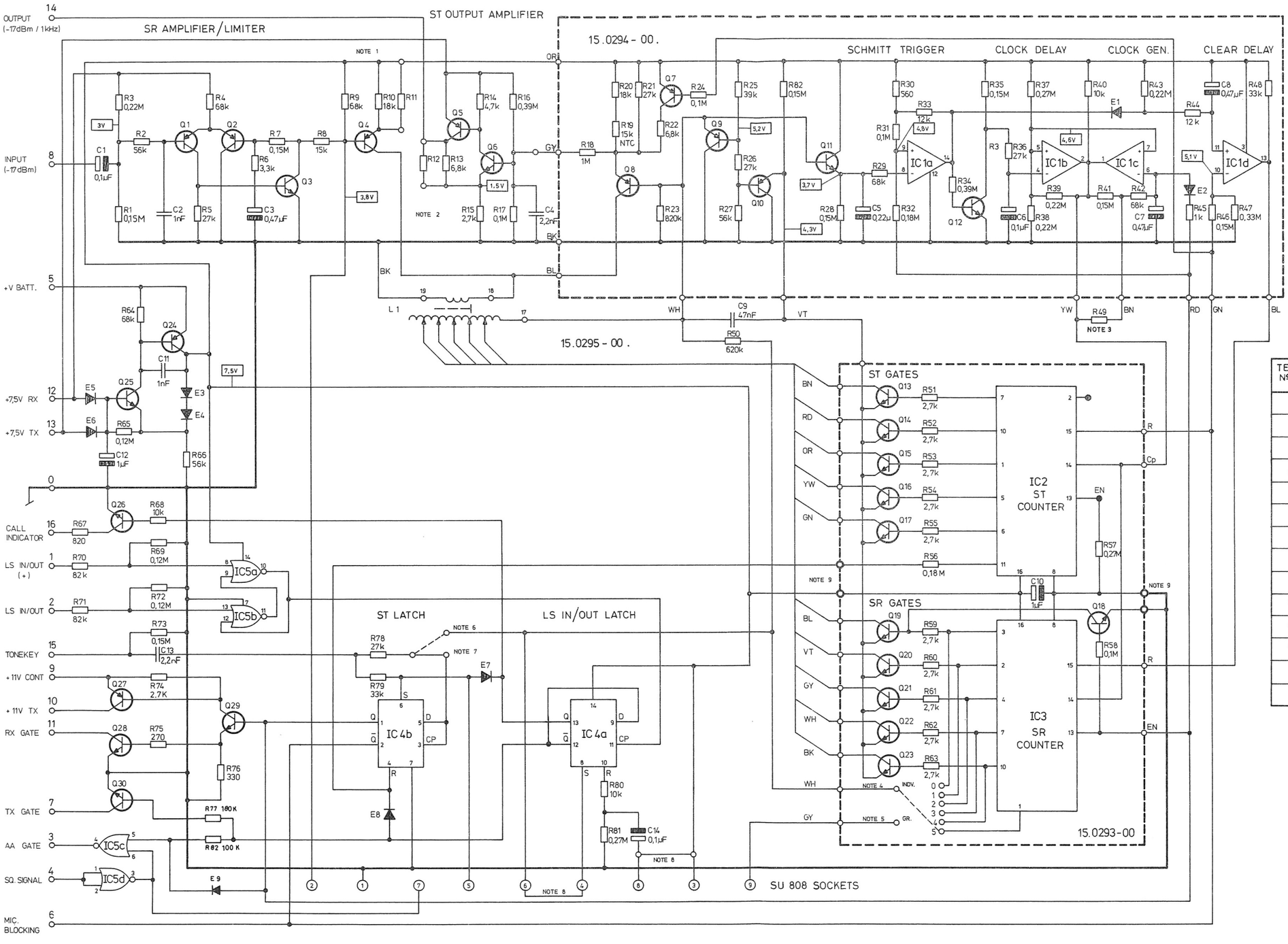
NOTE 4. DIODE ONLY TO BE INSTALLED IN CQP 863U WITH ST801

TONE EQUIPMENT WIRING CQP800U

D402.561/3

Storno

Storno

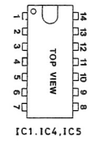


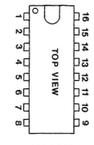
NOTES

1. BANDWIDTH ADJUST
2. OUTPUT ADJUST
3. TONELENGTH ADJUST
4. SHORTED FOR INDIVIDUAL SEQUENCE CALL.
   INDV. 3: 3-TONE SEQUENCE CALL.
   INDV: 4: 4-TONE SEQUENCE CALL.
   INDV. 5: 5-TONE SEQUENCE CALL.
5. SHORTED FOR GROUP CALL.
   GR. 2: GROUP CALL ON 3rd DIGIT
   GR. 3: GROUP CALL ON 4th DIGIT
   GR. 4: GROUP CALL ON 5th DIGIT
6. SHORTED FOR AUTO RECEIPT
7. OPEN FOR AUTO RECEIPT
8. REMOVE WITH GROUP CALL
9. THESE CONNECTIONS ARE TO BE REESTABLISH FOR OPERATION IN DISMANTLED CONDITION

SPECIAL FACILLITIES, SEE INSTRUCTION NO. 24.52

TERM. Nº	DIGIT	TQ802 Hz	TQ803 CCIR Hz
1	X	885	960
2	Y	970	1062
3	1	1060	1124
4	2	1160	1197
5	3	1270	1275
6	4	1400	1358
7	5	1530	1446
8	6	1670	1540
9	7	1830	1640
10	8	2000	1747
11	9	2200	1860
12	0	2400	1981
13	REPEAT	2600	2110
14	A	2800	

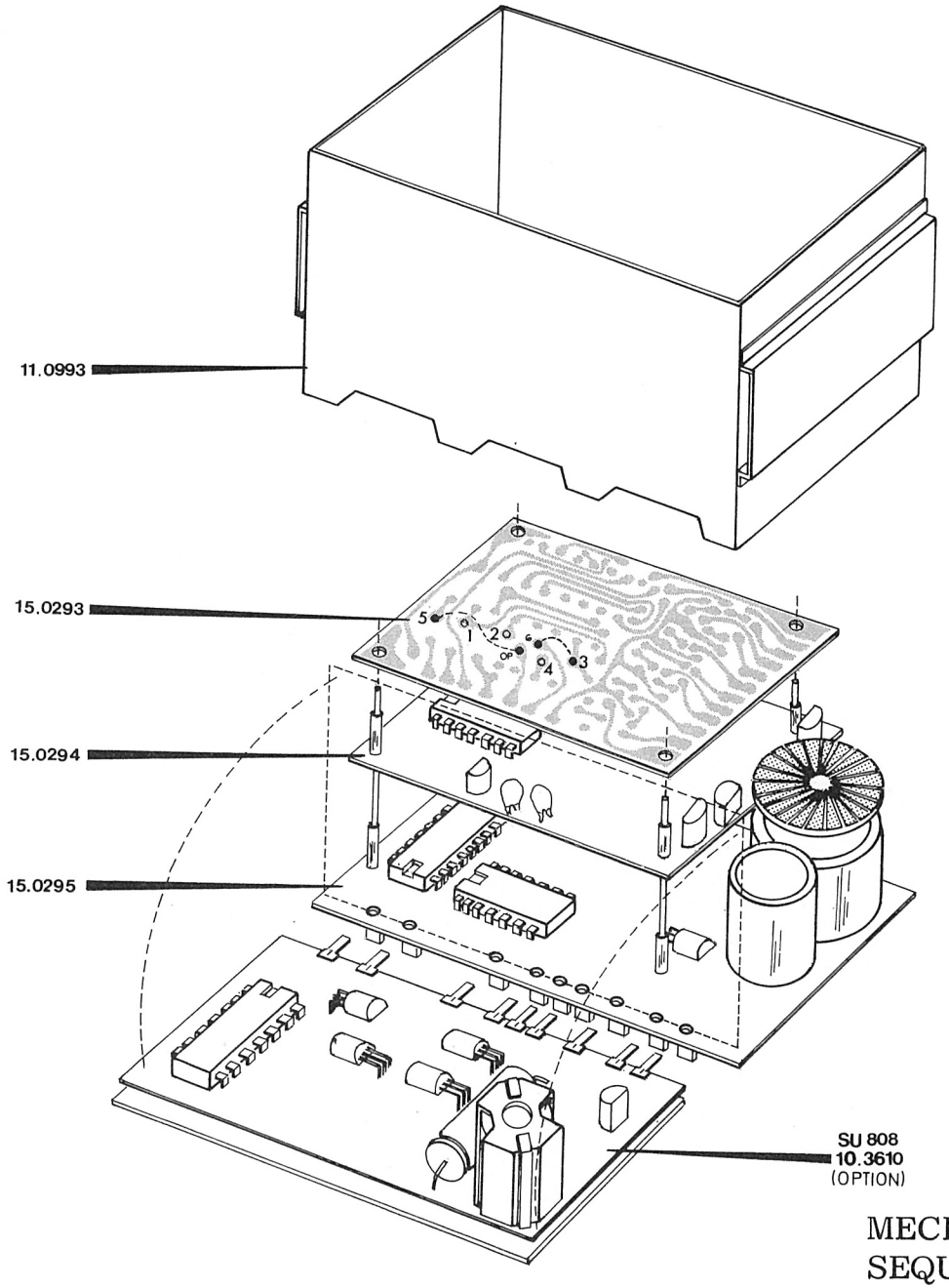




SEQUENTIAL TONE UNIT TQ802, TQ80
Transmitter/Receiver

D 402.315/

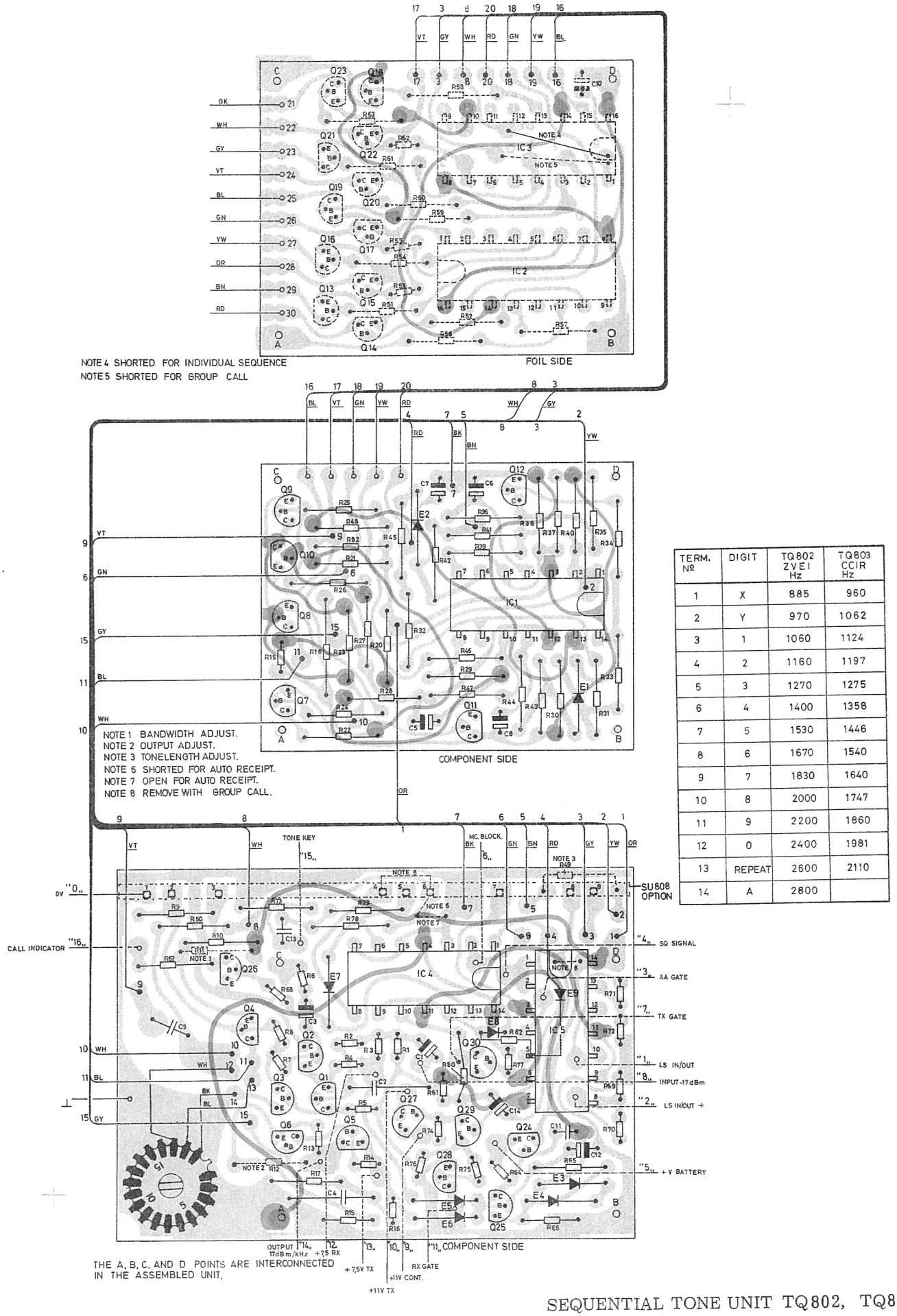
Storno



MECHANICAL LAYOUT SEQUENTIAL TONE UNIT TQ802-TQ803

D402.514

Storno



TERM. Nº	DIGIT	TQ802 ZVEI Hz	TQ803 CCIR Hz
1	X	885	960
2	Y	970	1062
3	1	1060	1124
4	2	1160	1197
5	3	1270	1275
6	4	1400	1358
7	5	1530	1446
8	6	1670	1540
9	7	1830	1640
10	8	2000	1747
11	9	2200	1860
12	0	2400	1981
13	REPEAT	2600	2110
14	A	2800	

SEQUENTIAL TONE UNIT TQ802, TQ803
Transmitter/Receiver

Storno

TYPE	Nº	CODE	DATA
TQ802		10.3425-00	Sequential Tone Transmitter/Receiver
TQ803		10.3426-00	Sequential Tone Transmitter/Receiver
	C1	73.5089	0.1 µF 20% tantal 35 V
	C2	76.5109	1 nF 2.5% polystyr TB 25 V
	C3	73.5125	0.47 µF 20% tantal 35 V
	C4	76.5124	2.2 nF 10% ceram PL 63 V
	C5	73.5118	0.22 µF 20% tantal 35 V
	C6	73.5089	0.1 µF 20% " 35 V
	C7	73.5125	0.47 µF 20% " 35 V
	C8	73.5125	0.47 µF 20% " 35 V
	C9	76.5122	47 nF 2% polystyr TB 20 V
	C10	73.5114	1 µF 20% tantal 35 V
	C11	76.5069	1 nF 10% polyest FL 50 V
	C12	73.5114	1 µF 20% tantal 35 V
	C13	74.5346	2.2 nF 10% ceram PL 63 V
	C14	73.5089	0.1 µF 20% tantal 35 V
	R1	80.5075	0.15 MΩ 5% carbon film 0.1 W
	R2	80.5070	56 kΩ 5% " " 0.1 W
	R3	80.5077	0.22 MΩ 5% " " 0.1 W
	R4	80.5071	68 kΩ 5% " " 0.1 W
	R5	80.5066	27 kΩ 5% " " 0.1 W
	R6	80.5055	3.3 kΩ 5% " " 0.1 W
	R7	80.5075	0.15 MΩ 5% " " 0.1 W
	R8	80.5063	15 kΩ 5% " " 0.1 W
	R9	80.5071	68 kΩ 5% " " 0.1 W
	R10	80.5064	18 kΩ 5% " " 0.1 W
	R11	80.50xx	ADJ 5% " " 0.1 W
	R12	80.50xx	ADJ 5% " " 0.1 W
	R13	80.5059	6.8 kΩ 5% " " 0.1 W
	R14	80.5057	4.7 kΩ 5% " " 0.1 W
	R15	80.5054	2.7 kΩ 5% " " 0.1 W
	R16	80.5080	0.39 MΩ 5% " " 0.1 W
	R17	80.5073	0.1 MΩ 5% " " 0.1 W
	R18	89.5074	1 MΩ 2% metal film 0.1 W
	R19	89.5076	15 kΩ 5% NTC 0.5 W
	R20	80.5064	18 kΩ 5% carbon film 0.1 W
	R21	80.5066	27 kΩ 5% " " 0.1 W
	R22	80.5059	6.8 kΩ 5% " " 0.1 W
	R23	80.5084	0.82 MΩ 5% " " 0.1 W
	R24	80.5073	0.1 MΩ 5% " " 0.1 W
	R25	80.5068	39 kΩ 5% " " 0.1 W
	R26	80.5066	27 kΩ 5% " " 0.1 W
	R27	80.5070	56 kΩ 5% " " 0.1 W
	R28	80.5075	0.15 MΩ 5% " " 0.1 W
	R29	80.5071	68 kΩ 5% " " 0.1 W
	R30	80.5046	560 Ω 5% " " 0.1 W

Storno

TYPE	Nº	CODE	DATA
	R31	80.5073	0.1 MΩ 5% carbon film 0.1 W
	R32	80.5076	0.18 MΩ 5% " " 0.1 W
	R33	80.5062	12 kΩ 5% " " 0.1 W
	R34	80.5080	0.39 MΩ 5% " " 0.1 W
	R35	80.5075	0.15 MΩ 5% " " 0.1 W
	R36	80.5066	27 kΩ 5% " " 0.1 W
	R37	80.5078	0.27 MΩ 5% " " 0.1 W
	R38	80.5077	0.22 MΩ 5% " " 0.1 W
	R39	80.5077	0.22 MΩ 5% " " 0.1 W
	R40	80.5061	10 kΩ 5% " " 0.1 W
	R41	80.5075	0.15 MΩ 5% " " 0.1 W
	R42	80.5071	68 kΩ 5% " " 0.1 W
	R43	80.5077	0.22 MΩ 5% " " 0.1 W
	R44	80.5062	12 kΩ 5% " " 0.1 W
	R45	80.5049	1 kΩ 5% " " 0.1 W
	R46	80.5075	0.15 MΩ 5% " " 0.1 W
	R47	80.5079	0.33 MΩ 5% " " 0.1 W
	R48	80.5067	33 kΩ 5% " " 0.1 W
	R49	80.50xx	ADJ 5% " " 0.1 W
	R50	80.5083	0.68 MΩ 5% " " 0.1 W
	R51	80.5054	2.7 kΩ 5% " " 0.1 W
	R52	80.5054	2.7 kΩ 5% " " 0.1 W
	R53	80.5054	2.7 kΩ 5% " " 0.1 W
	R54	80.5054	2.7 kΩ 5% " " 0.1 W
	R55	80.5054	2.7 kΩ 5% " " 0.1 W
	R56	80.5076	0.18 MΩ 5% " " 0.1 W
	R57	80.5078	0.27 MΩ 5% " " 0.1 W
	R58	80.5073	0.1 MΩ 5% " " 0.1 W
	R59	80.5054	2.7 kΩ 5% " " 0.1 W
	R60	80.5054	2.7 kΩ 5% " " 0.1 W
	R61	80.5054	2.7 kΩ 5% " " 0.1 W
	R62	80.5054	2.7 kΩ 5% " " 0.1 W
	R63	80.5054	2.7 kΩ 5% " " 0.1 W
	R64	80.5071	68 kΩ 5% " " 0.1 W
	R65	80.5074	0.12 MΩ 5% " " 0.1 W
	R66	80.5070	56 kΩ 5% " " 0.1 W
	R67	80.5048	820 Ω 5% " " 0.1 W
	R68	80.5061	10 kΩ 5% " " 0.1 W
	R69	80.5074	0.12 MΩ 5% " " 0.1 W
	R70	80.7072	82 kΩ 5% " " 0.1 W
	R71	80.7072	82 kΩ 5% " " 0.1 W
	R72	80.5074	0.12 MΩ 5% " " 0.1 W
	R73	80.5075	0.15 MΩ 5% " " 0.1 W

SEQUENTIAL TONE UNIT TQ802, TQ803
Transmitter/Receiver

X402.531

TYPE	Nº	CODE	DATA
	R74	80.5054	2.7 kΩ 5% carbon film 0.1 W
	R75	80.5042	270 Ω 5% " " 0.1 W
	R76	80.5043	330 Ω 5% " " 0.1 W
	R77	80.5076	0.18 MΩ 5% " " 0.1 W
	R78	80.5066	27 kΩ 5% " " 0.1 W
	R79	80.5067	33 kΩ 5% " " 0.1 W
	R80	80.5061	10 kΩ 5% " " 0.1 W
	R81	80.5078	0.27 MΩ 5% " " 0.1 W
TQ802	L1	61.1337	Tone Coil
TQ803	L1	61.1366	Tone Coil
	E1	99.5237	1 N 4148 Diode
	E2	99.5237	1 N 4148 Diode
	E3	99.5237	1 N 4148 Diode
	E4	99.5237	1 N 4148 Diode
	E5	99.5237	1 N 4148 Diode
	E6	99.5237	1 N 4148 Diode
	E7	99.5237	1 N 4148 Diode
	E8	99.5237	1 N 4148 Diode
	Q1	99.5230	BC308 Transistor
	Q2	99.5230	BC308 "
	Q3	99.5143	BC238 "
	Q4	99.5230	BC308 "
	Q5	99.5230	BC308 "
	Q6	99.5143	BC238 "
	Q7	99.5230	BC308 "
	Q8	99.5115	BC309 "
	Q9	99.5230	BC308 "
	Q10	99.5230	BC308 "
	Q11	99.5143	BC238 "
	Q12	99.5143	BC238 "
	Q13	99.5324	BC338-25 "
	Q14	99.5324	BC338-25 "
	Q15	99.5324	BC338-25 "
	Q16	99.5324	BC338-25 "
	Q17	99.5324	BC338-25 "
	Q18	99.5143	BC238 "
	Q19	99.5324	BC338-25 "
	Q20	99.5324	BC338-25 "
	Q21	99.5324	BC338-25 "
	Q22	99.5324	BC338-25 "
	Q23	99 5324	BC338-25 "
	Q24	99.5230	BC308 "
	Q25	99.5143	BC238 "
	Q26	99.5143	BC238 "
	Q27	99.5337	BC369 "

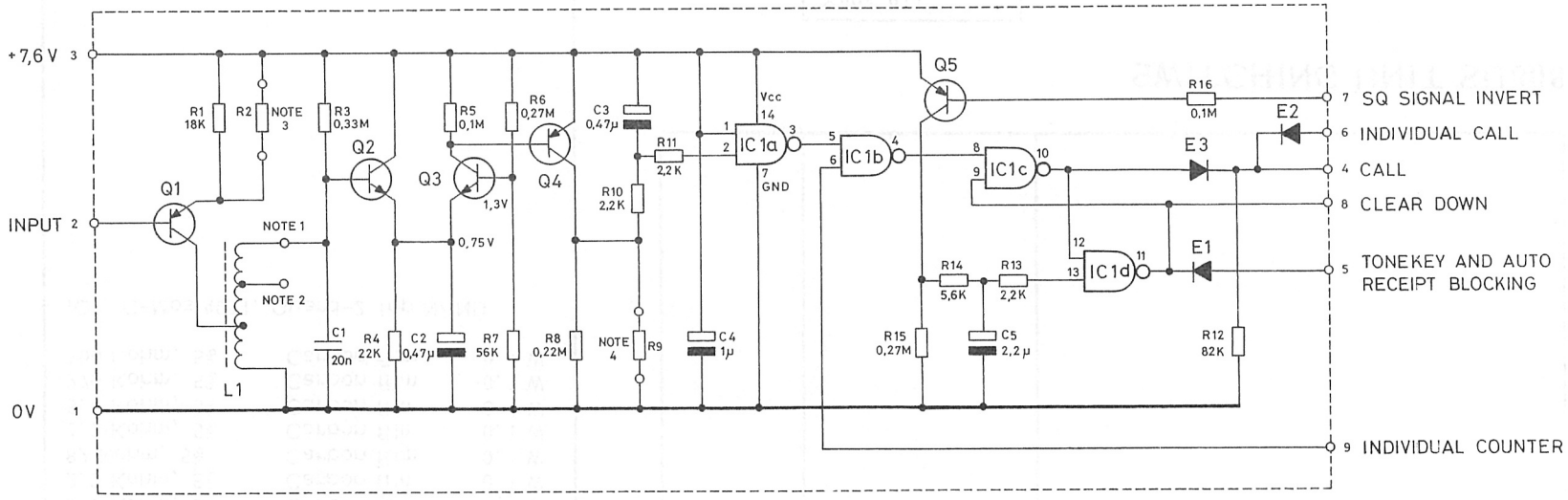
Storno

TYPE	Nº	CODE	DATA
	Q28	99.5143	BC238 Transistor
	Q29	99.5324	BC338-25 "
	Q30	99.5143	BC238 "
	IC1	14.5019	MC3302P quad. comparator
	iC2	14.5052	CD4017 decimal counter/divider
	IC3	14.5052	CD4017 decimal counter/divider
	IC4	14.5098	CD4013 dual D-flip-flop
	IC5	14.5074	CD4001 quad. 2-input NOR

SEQUENTIAL TONE UNIT TQ802, TQ803
Transmitter/Receiver

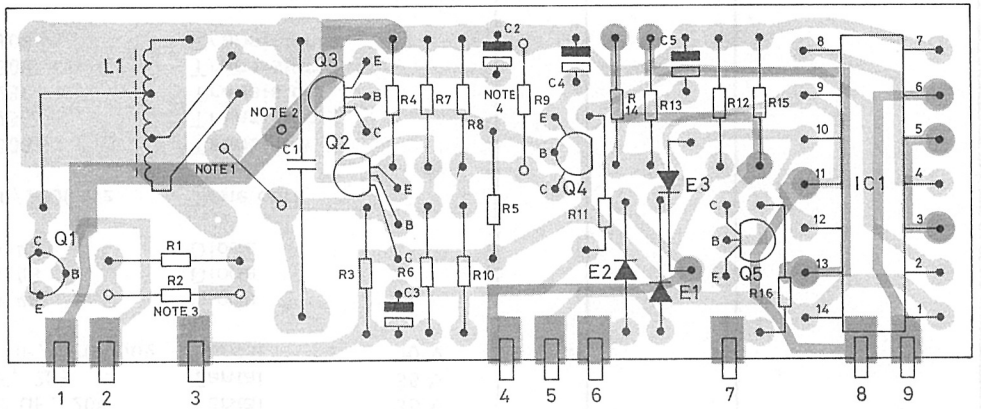
X402.531

Storno



NOTE 1 : 2400 Hz
NOTE 2 : 2800 Hz
NOTE 3 : BANDWIDTH ADJUST.
NOTE 4 : SET UP TIME ADJUST.

PRINTED CIRCUIT VIEWED FROM COMPONENT SIDE.



GROUP CALL UNIT SU 808

D 402.407/2

Storno

Nº	CODE	DATA		
C1	76.5127	20 nF, 2%	Polyester	63 V
C2	73.5134	0.47 uF, -20 +50%	Tantal	16 V
C3	73.5125	0.47 uF, 20%	Tantal	35 V
C4	73.5114	1 uF, 20%	Tantal	35 V
C5	73.5129	2.2 uF, -20 +50%	Tantal	10 V
D1	99.5237	1N4148	Diode	
D2	99.5237	1N4148	Diode	
D3	99.5237	1N4148	Diode	
L1	61.1358	2400/2800 Hz	Tone coil	
Q1	99.5230	BC308	Transistor	
Q2	99.5143	BC238	Transistor	
Q3	99.5143	BC238	Transistor	
Q4	99.5230	BC308	Transistor	
Q5	99.5230	BC308	Transistor	
R1	80.5064	18 Kohm, 5%	Carbon film	0.1 W
R2	80.50xx	xx Kohm, 5%	Carbon film	0.1 W
R3	80.5079	330 Kohm, 5%	Carbon film	0.1 W
R4	80.5065	22 Kohm, 5%	Carbon film	0.1 W
R5	80.5073	100 Kohm, 5%	Carbon film	0.1 W
R6	80.5078	270 Kohm, 5%	Carbon film	0.1 W
R7	80.5070	56 Kohm, 5%	Carbon film	0.1 W
R8	80.5077	220 Kohm, 5%	Carbon film	0.1 W
R9	80.50xx	xx Kohm, 5%	Carbon film	0.1 W
R10	80.5053	2.2 Kohm, 5%	Carbon film	0.1 W
R11	80.5053	2.2 Kohm, 5%	Carbon film	0.1 W
R12	80.5072	82 Kohm, 5%	Carbon film	0.1 W
R13	80.5053	2.2 Kohm, 5%	Carbon film	0.1 W
R14	80.5058	5.6 Kohm, 5%	Carbon film	0.1 W
R15	80.5078	270 Kohm, 5%	Carbon film	0.1 W
R16	80.5073	100 Kohm, 5%	Carbon film	0.1 W
U1	14.5051	IC1, C-Mos 4011, Quard-2 inp NAND		

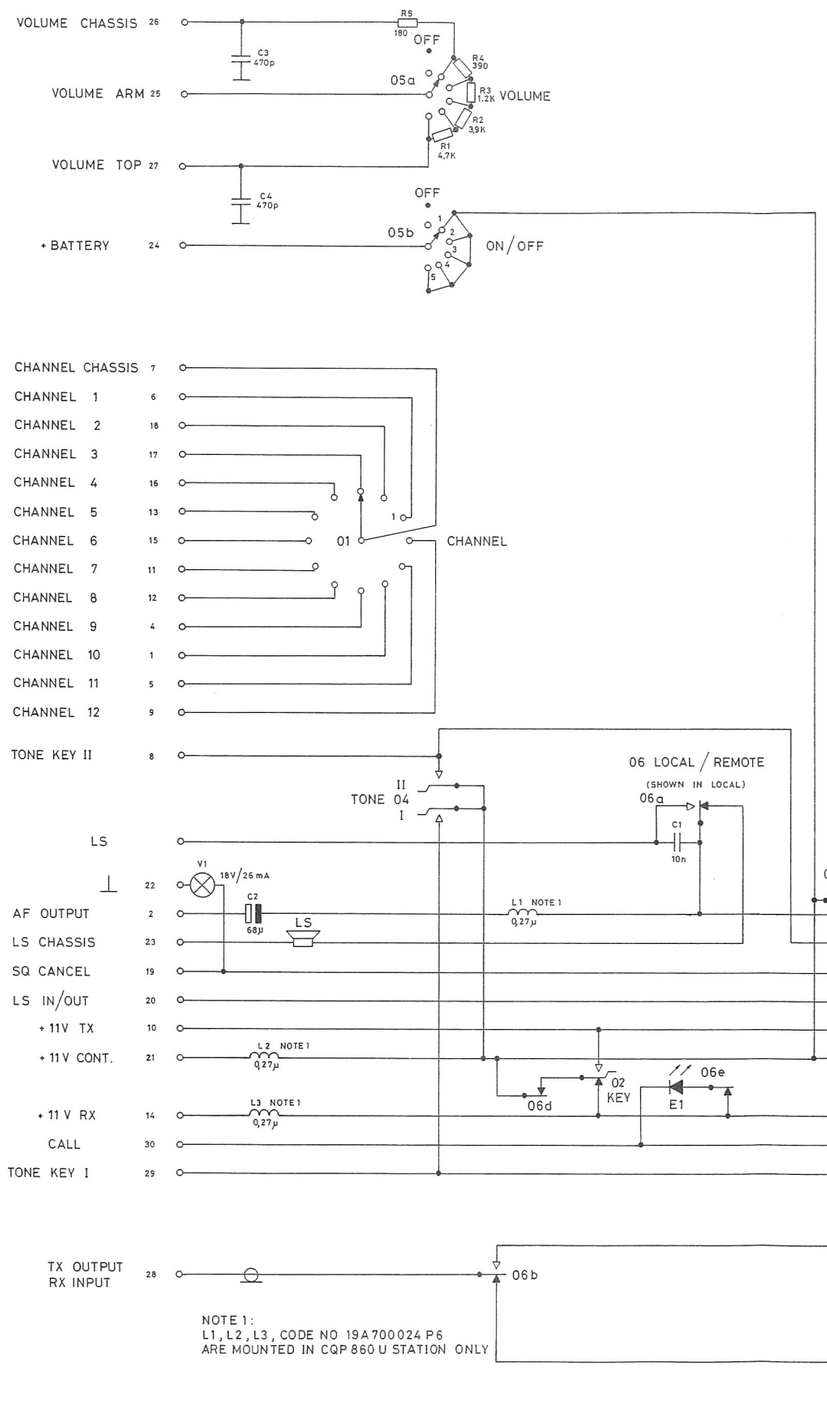
Storno

Nº	CODE	DATA

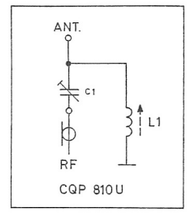
SWITCHING UNIT SU808

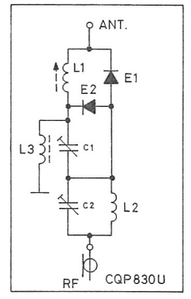
X403.011

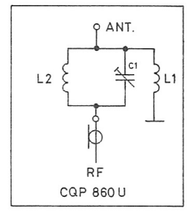
Storno

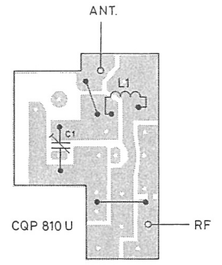


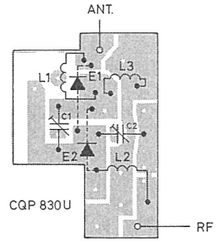
ANTENNA MATCHING CIRCUIT

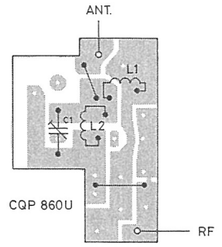


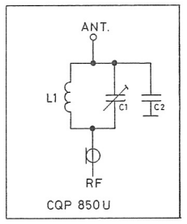


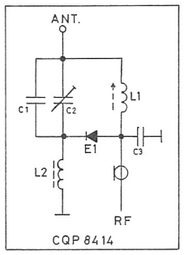








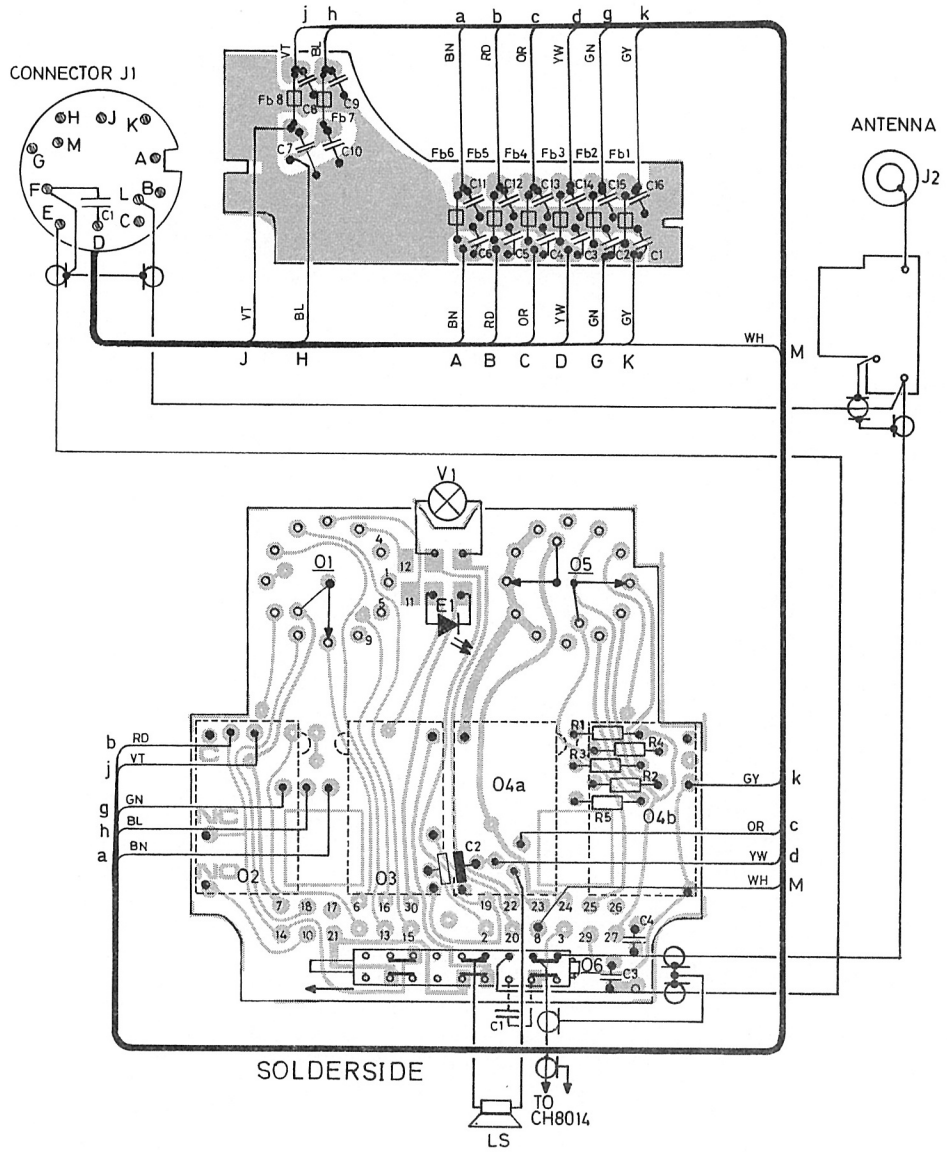


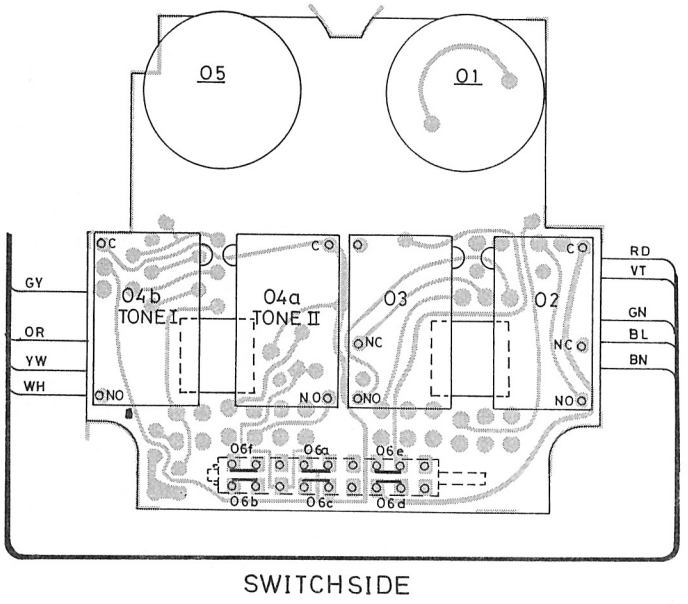


CONTROL HEAD CP808

D 402.595/2

Storno





CONTROL HEAD CP808

D402.469/3

TYPE	Nº	CODE	DATA	
		10.3375	Control Head CP808	
		15.0314-01	Switch, p.c.b. assembly	
	C1	74.5280	10nF 20% ceram CP	50V
	C2	73.5106	68uF 20% tantal	16V
	C3	74.5312	470pF-20/+80% ceram PL	63V
	C4	74.5312	470pF-20/+80% ceram PL	63V
	R1	80.5057	4.7kohm 5% carbon film	1/10W
	R2	80.5056	3.9kohm 5% carbon film	1/10W
	R3	80.5050	1.2kohm 5% carbon film	1/10W
	R4	80.5044	390ohm 5% carbon film	1/10W
	R5	80.5040	120ohm 5% carbon film	1/10W
	02	47.5092	Microswitch, Key	
	03	47.5092	Microswitch, LS/SQ	
	04	47.5092	Microswitch, Tone	
	06	47.5092	Microswitch, Tone	
		15.0315	Filter, p.c.b. assembly	
	C1-16	74.5314	820pF 20% ceramic	
	Fb	65.5109	Ferrite bead	
	01	47.0626	Rotary switch 1x12	
	05	47.0627	Rotary switch 2x6	
	E1	99.5339	LD 30/11 LED	
	V1	92.5115	Lamp, 18V/26mA	
	LS	97.5037	Loudspeaker	
	J1	41.0218	12-pin Connector, female	
	C17	74.5312	470pF-20+80% ceram PL	63V
	C18	74.5312	470pF-20+80% ceram PL	63V
	C19	74.5312	470pF-20+80% ceram PL	63V
CQP810U		15.0313	Antenna Matching Network 146-174MHz	
	C1	78.5046	2-18pF trimmer N350	300V
	L1	61.1359	RF coil	
CQP830		15.0329	Antenna Matching network 68-88MHz	
	C1	78.5046	2-18pF trimmer N350	300V
	C2	78.5046	2-18pF trimmer N350	300V
	L1	61.1363	RF coil	
	L2	62.0954	RF coil	
	L3	61.5015	3.3uH 20% RF choke	0.7A
	E1	99.5187	BA243 Diode	
	E2	99.5187	BA243 Diode	
CQP860U		15.0327	Antenna Matching Network 420-470MHz	
	C1	78.5046	2-18pF trimmer N350	300V
	L1	62.0948	RF coil	
	L2	62.0947	RF coil	

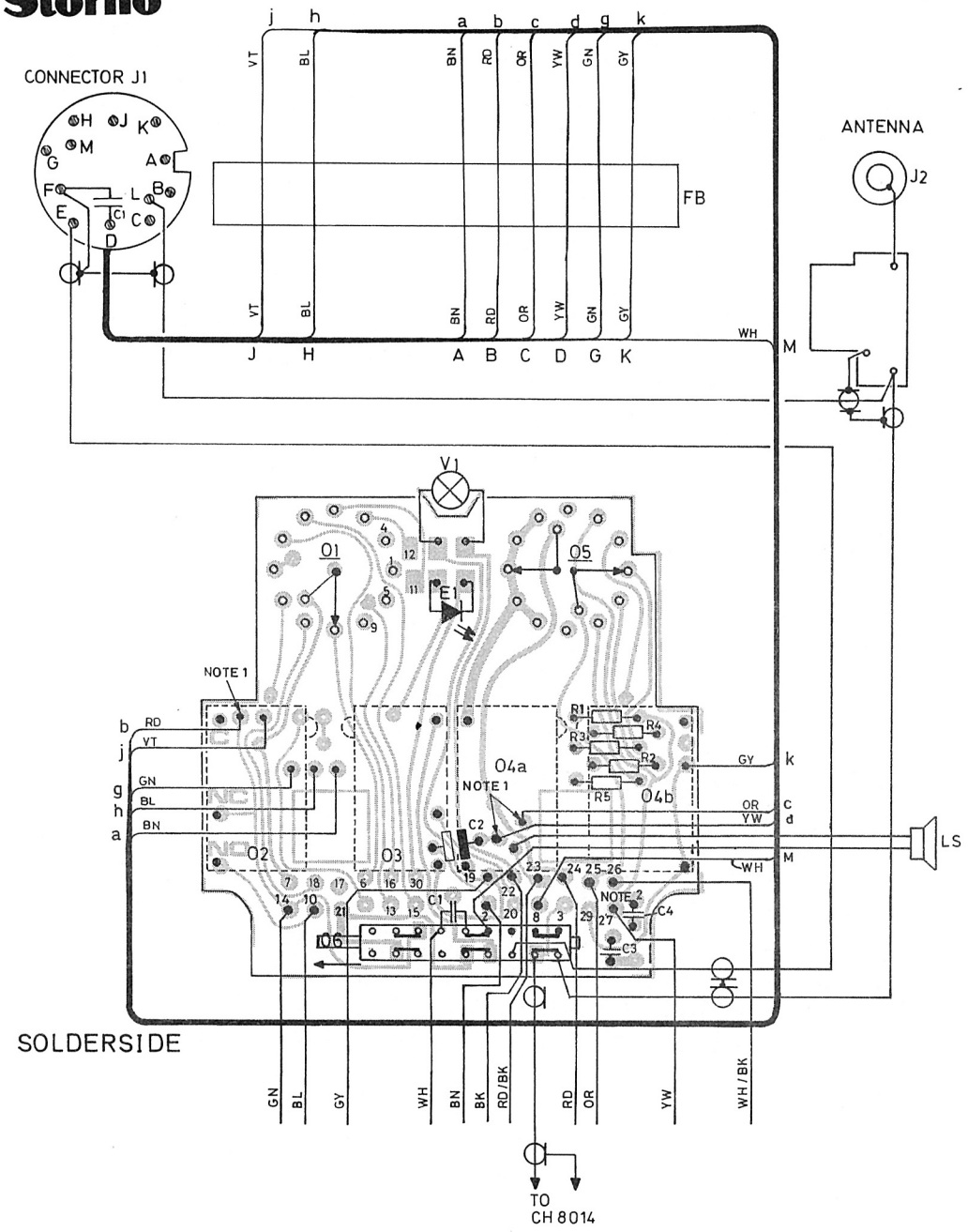
Storno

TYPE	Nº	CODE	DATA

CONTROL HEAD CP808

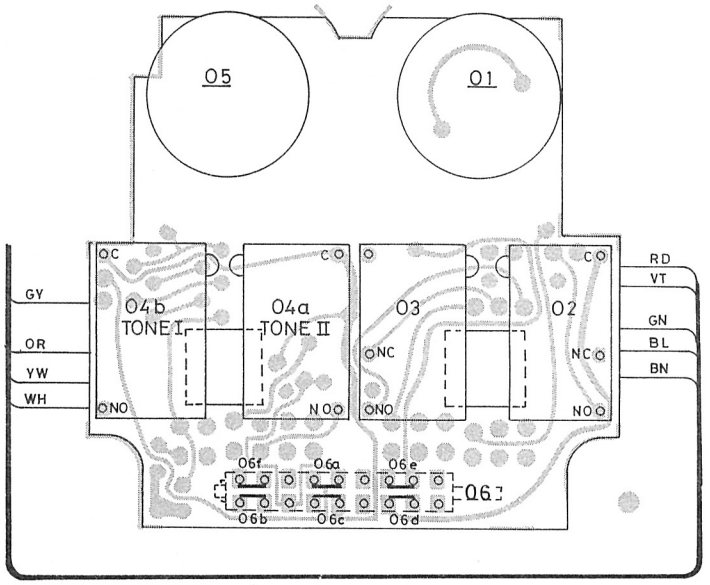
X402.575

Storno



NOTE 1:
L1, L2, L3, VALUE 0,27µ, CODE NO. 19A700024 P6
MOUNTED IN CQP860U ONLY

NOTE 2:
R6, 27K (ON TERMINAL 27)
MOUNTED ONLY IN CP808IS

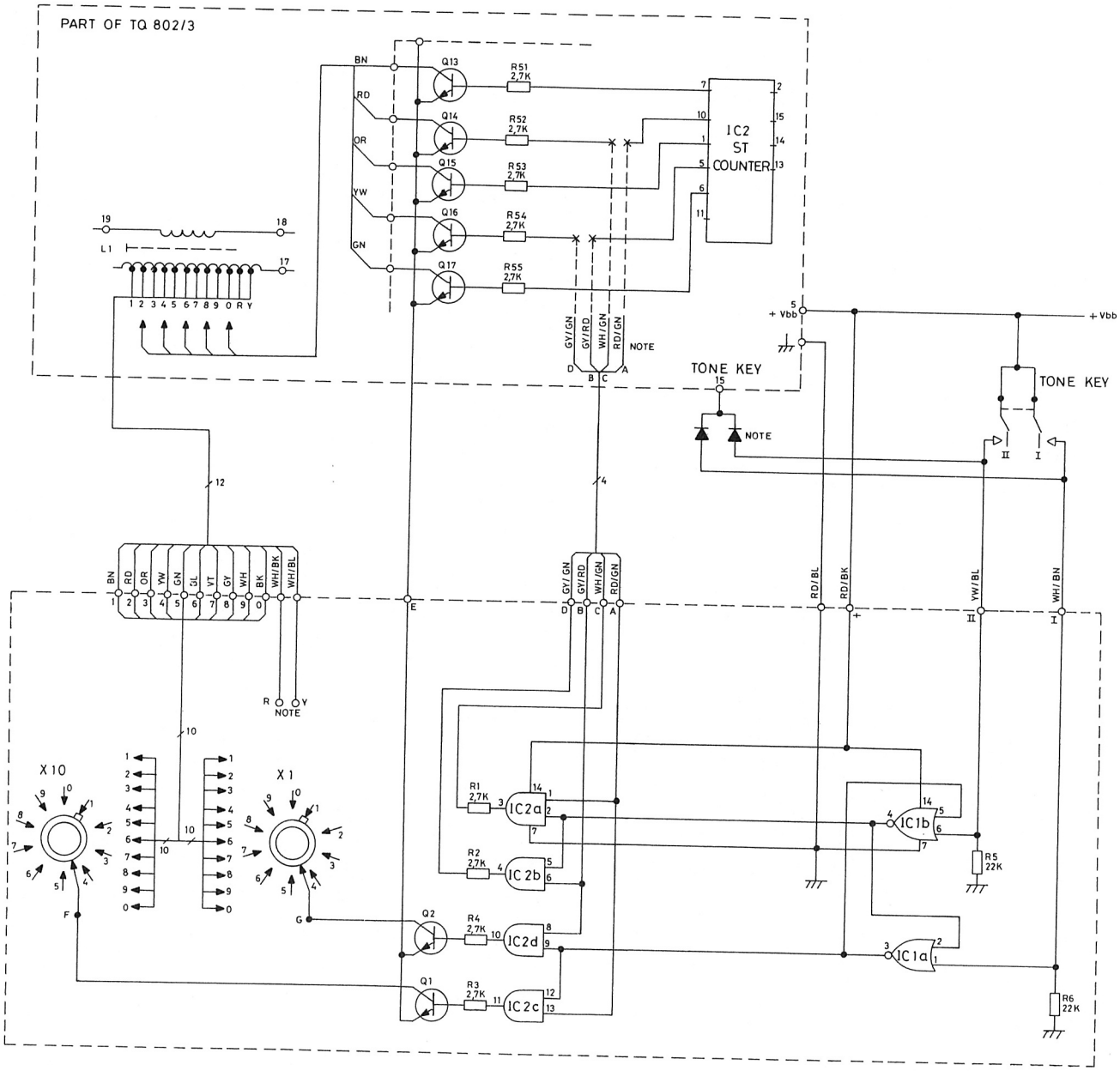


CONTROL HEAD CP808,
CP808 0,2W-IS, CP808 1W-IS, CP80XX
WIRING

D403.247

Storno

Storno

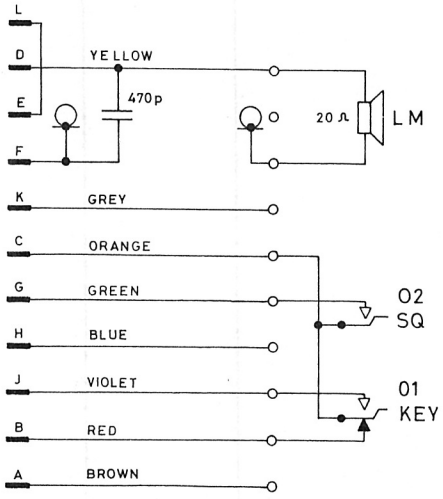


NOTE:
SEE CODING AND STRAPPING

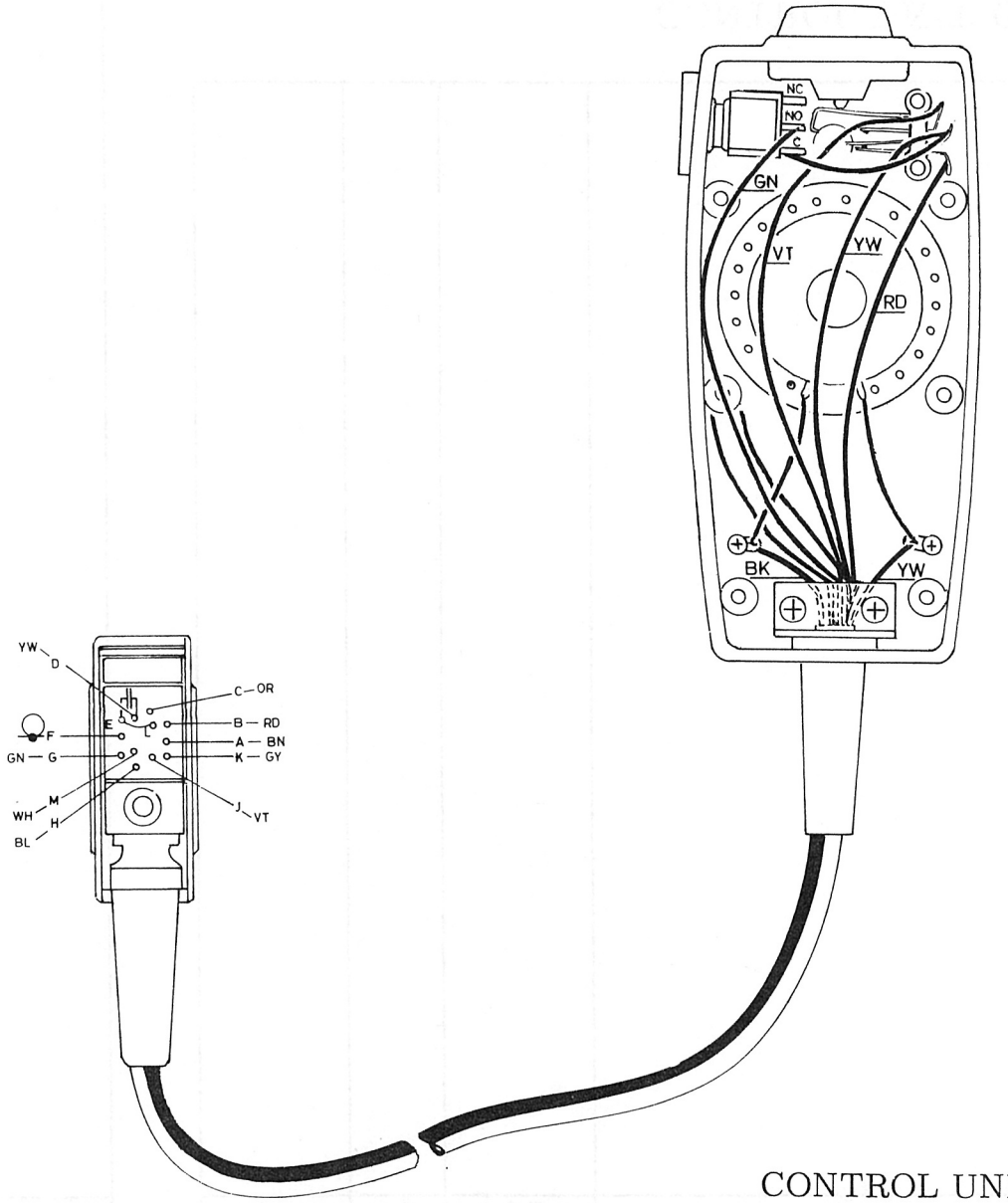
CONTROL PANEL CP8017

D403.059

Storno



CB 804



CONTROL UNIT CB804

D402.525/2

Storno

TYPE	Nº	CODE	DATA
CB804		10.3602	Control Unit
	01	47.5033	Switch, Key
	02	47.0635	Switch, SQ
	LM	96.5086	Microphone, dynamic 20 Ohm

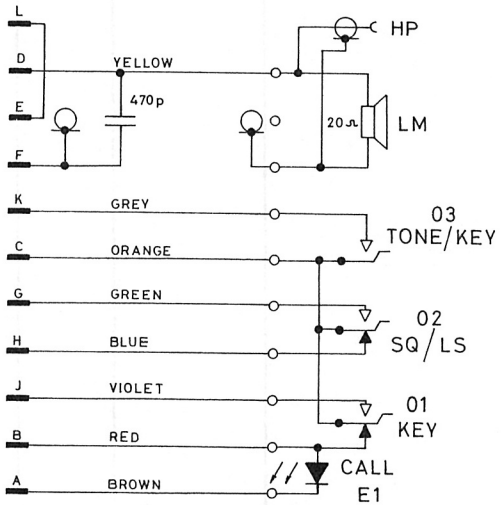
Storno

TYPE	Nº	CODE	DATA

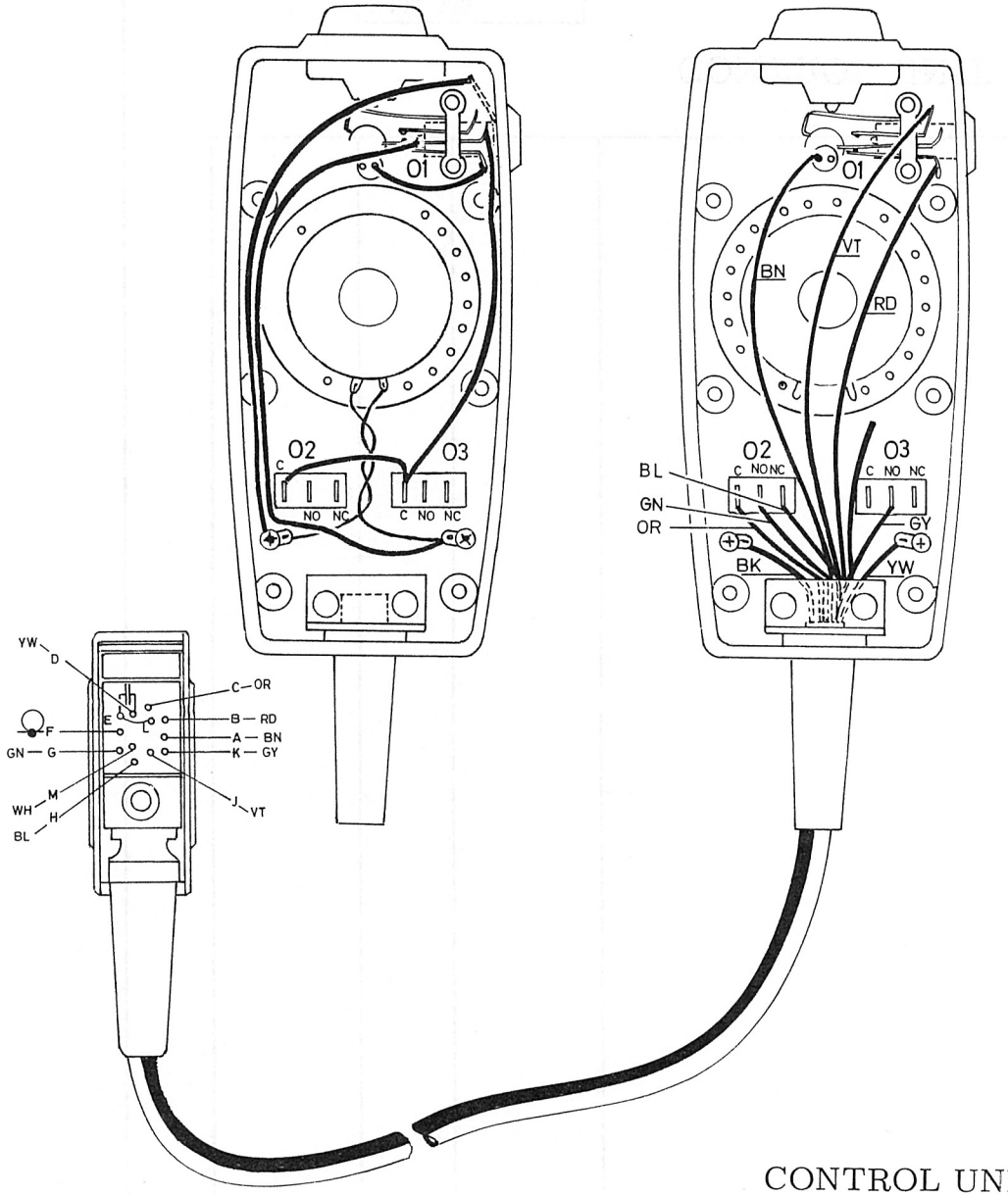
CONTROL UNIT CB804

X402.564

Storno



CB 805



CONTROL UNIT CB805

D 402.526/3

TYPE	Nº	CODE	DATA
CB805		10.3603	Control Unit
	01	47.5033	Switch, Key
	02	47.0635	Switch, SQ/LS
	03	47.0635	Switch, Tone Key
	LM	96.5086	Microphone, dynamic 20 Ohm

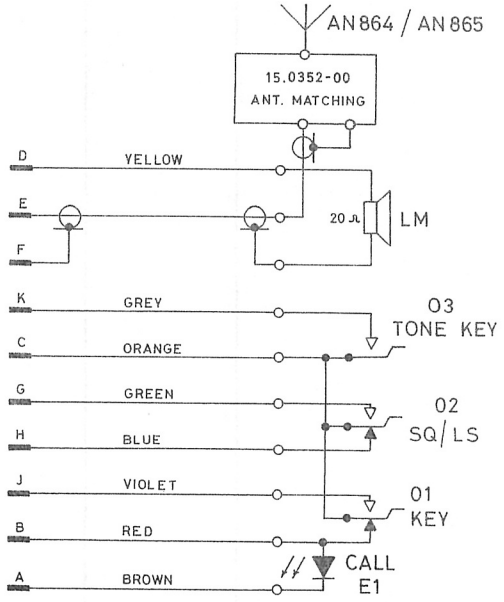
Storno

TYPE	Nº	CODE	DATA

CONTROL UNIT CB805

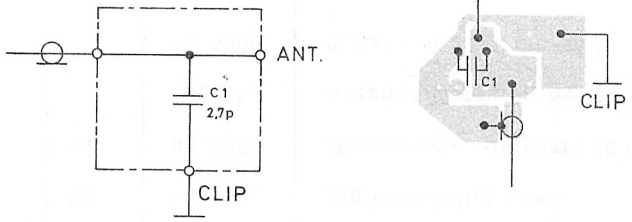
X402.565

Storno

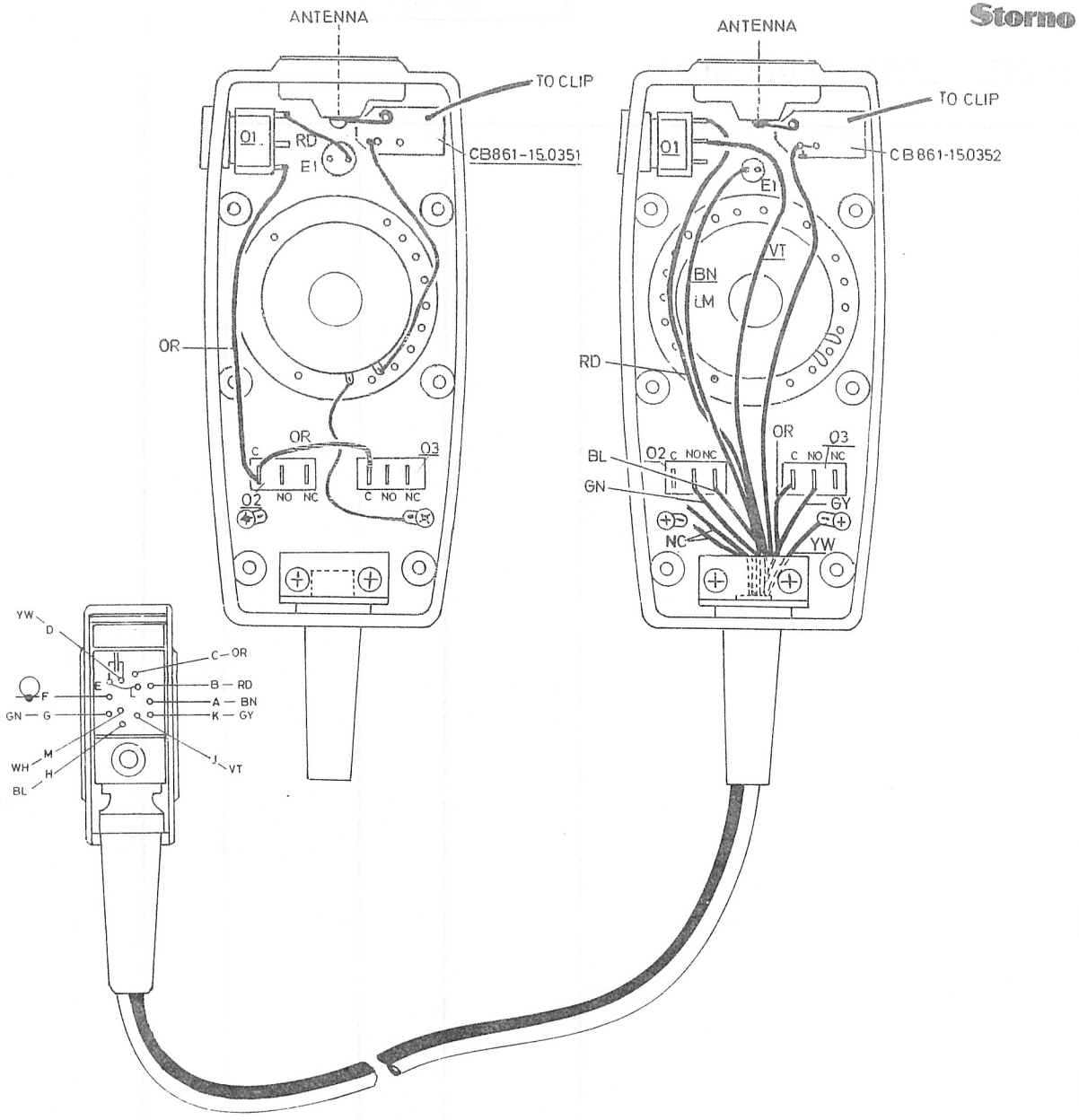


CB 861

CB 861 (420 - 470 MHz)



ANTENNA MATCHING NETWORK



Storno

CONTROL UNIT CB861

D 402.530

TYPE	Nº	CODE	DATA
CB861		10.3607	Control Unit (420-470 MHz)
	01	47.0635	Switch, Key
	02	47.0635	Switch, LS/SQ
	03	47.0635	Switch, Tone Key
	E1	99.5339	Light Emitting Diode
	LM	96.5086	Microphone, dynamic 20 Ohm
		15.0352	Antenna Matching Network
	C1	74.5300	2.7pF ± 0.25pF ceram PL 63V

Storno

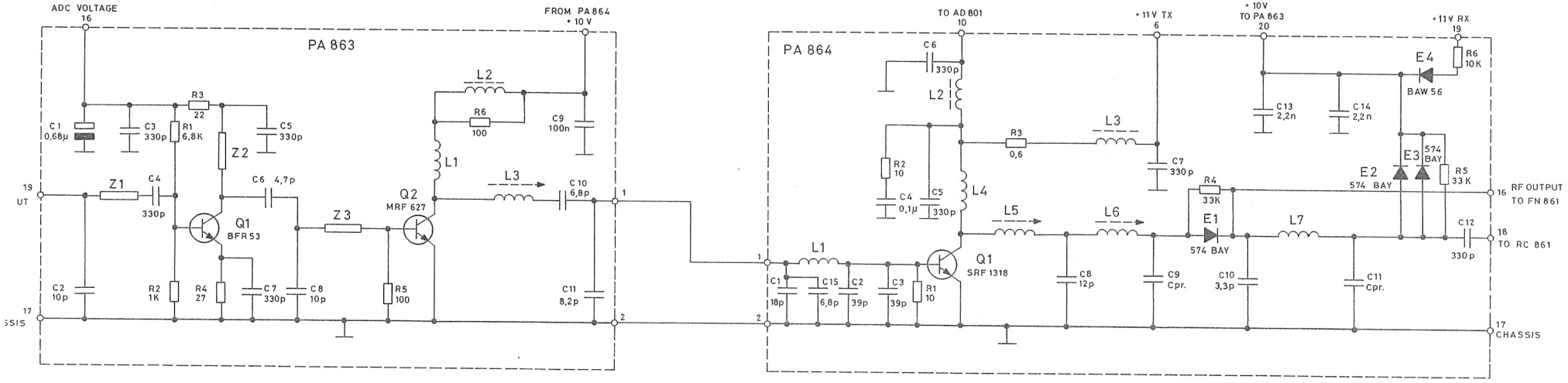
TYPE	Nº	CODE	DATA

CONTROL UNIT CB861

X402.568

Storno

Storno

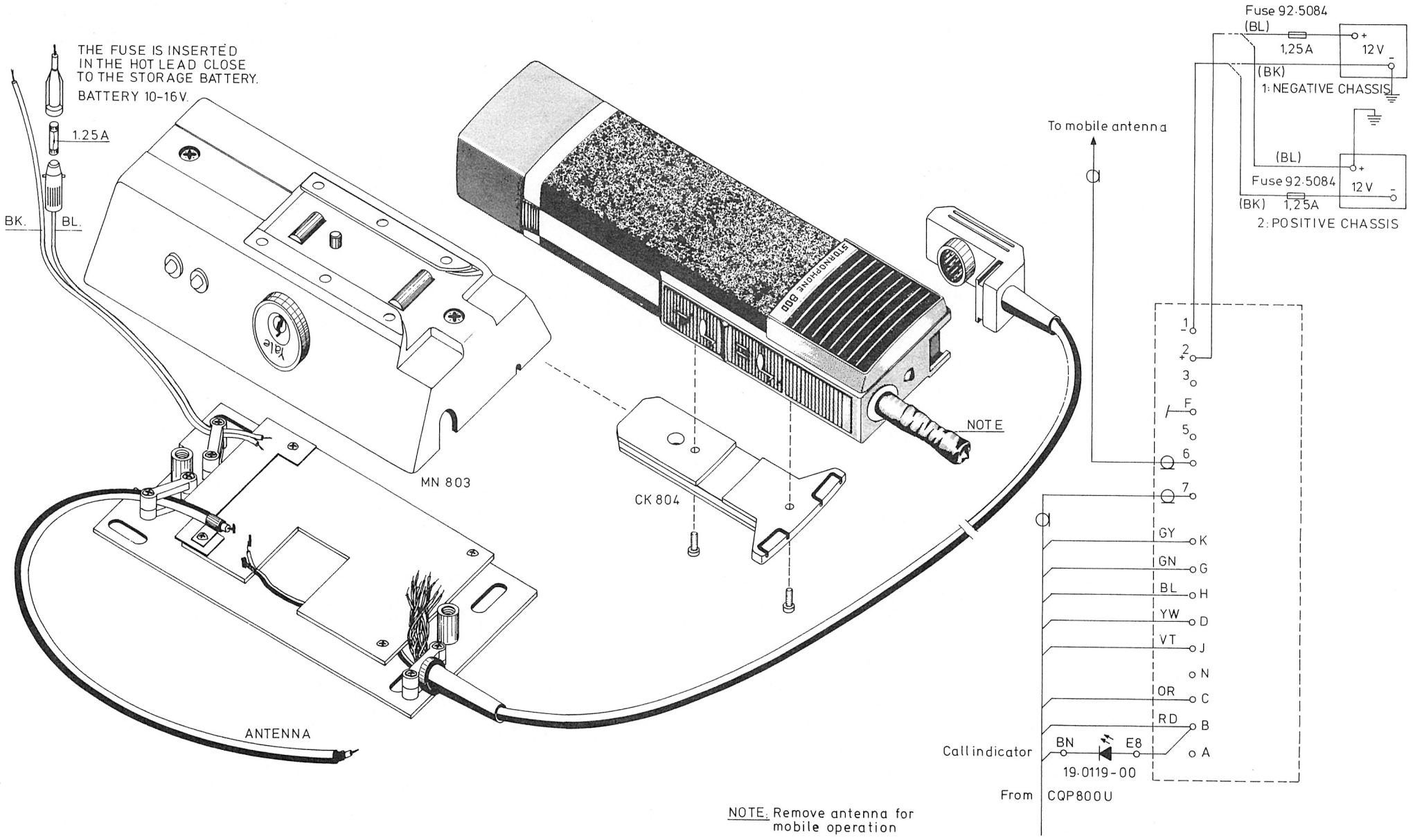


STORNOPHONE 800
3W TRANSMITTER

CQP 860, CQP 860 U

D402.553

Storno

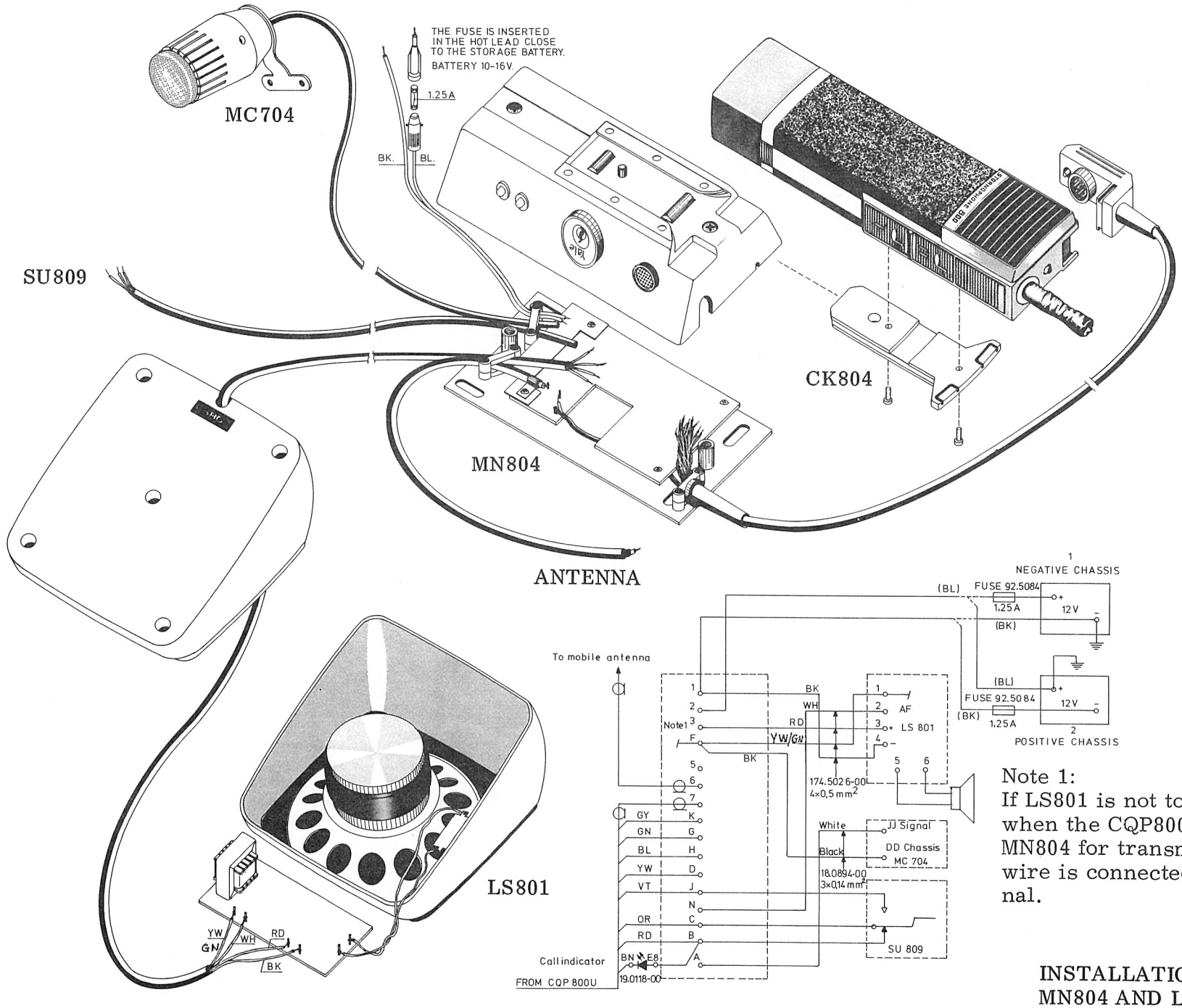


NOTE: Remove antenna for mobile operation

INSTALLATION DIAGRAM FOR MN 803

D402.600/1

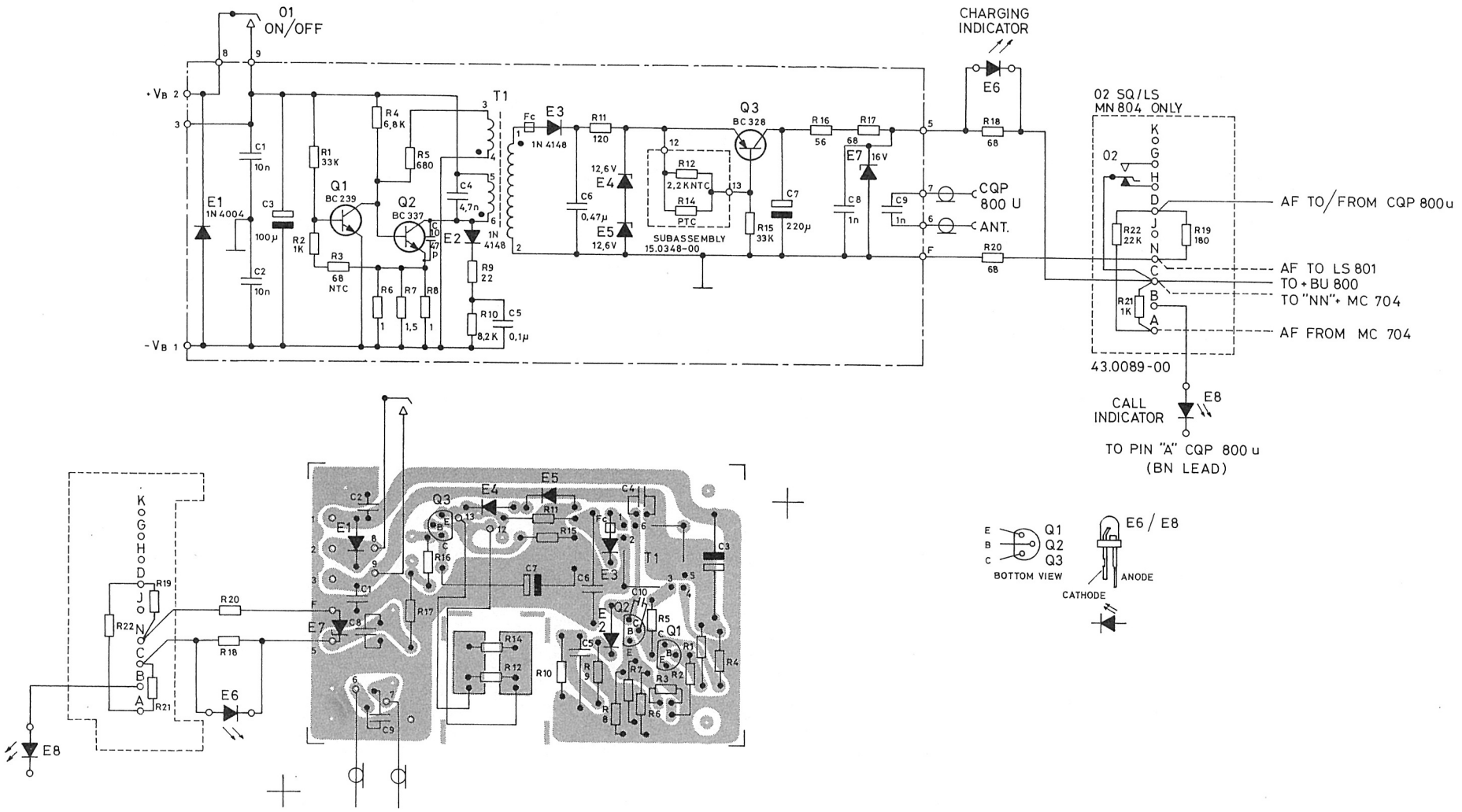
Storno



Note 1:
If LS801 is not to be disconnected when the CQP800 is removed from MN804 for transmitting, the red wire is connected to the (+) terminal.

INSTALLATION DIAGRAM FOR MN804 AND LS801 D 402.599/2

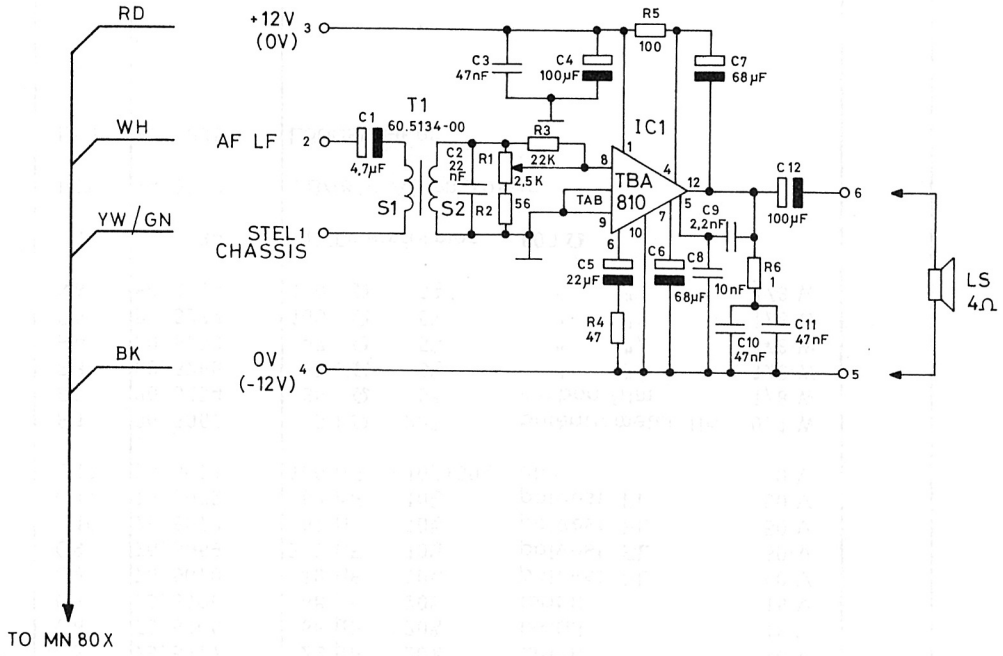
Storno

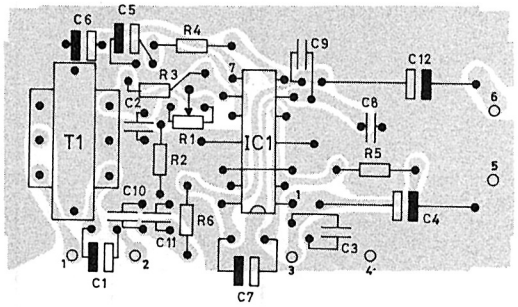


VEHICLE ADAPTOR MN803 / MN804

D 402.593/3

Storno





LOUDSPEAKER LS801

D402.423/1

Storno

TYPE	Nº	CODE	DATA
		97.0017	LS801 Loudspeaker with amplifier
	C1	73.5126	4.7 µF 20% tantal 35 V
	C2	76.5071	22 nF 10% polyest FL 50 V
	C3	76.5072	47 nF 10% polyest FL 50 V
	C4	73.5071	100 µF -10/+50% elco 40 V
	C5	73.5127	22 µF 20% tantal 16 V
	C6	73.5106	68 µF 20% tantal 16 V
	C7	73.5106	68 µF 20% tantal 16 V
	C8	76.5070	10 nF 10% polyest FL 50 V
	C9	76.5059	2.2 nF 10% polyest FL 50 V
	C10	76.5072	47 nF 10% polyest FL 50 V
	C11	76.5072	47 nF 10% polyest FL 50 V
	C12	73.5071	100 µF -10/+50% elco 40 V
	R1	86.5067	2.5 KΩ 20% potentiometer lin. 0.1 W
	R2	80.5234	56 Ω 5% carbon film 1/8 W
	R3	80.5265	22 KΩ 5% " " 1/8 W
	R4	80.5233	47 Ω 5% " " 1/8 W
	R5	80.5237	100 Ω 5% " " 1/8 W
	R6	80.5213	1.0 Ω 5% " " 1/8 W
	T1	60.5134	AF Transformer 600 Ω
	IC1	14.5104	TBA810 AF amplifier
	LS1	97.5035	Loudspeaker

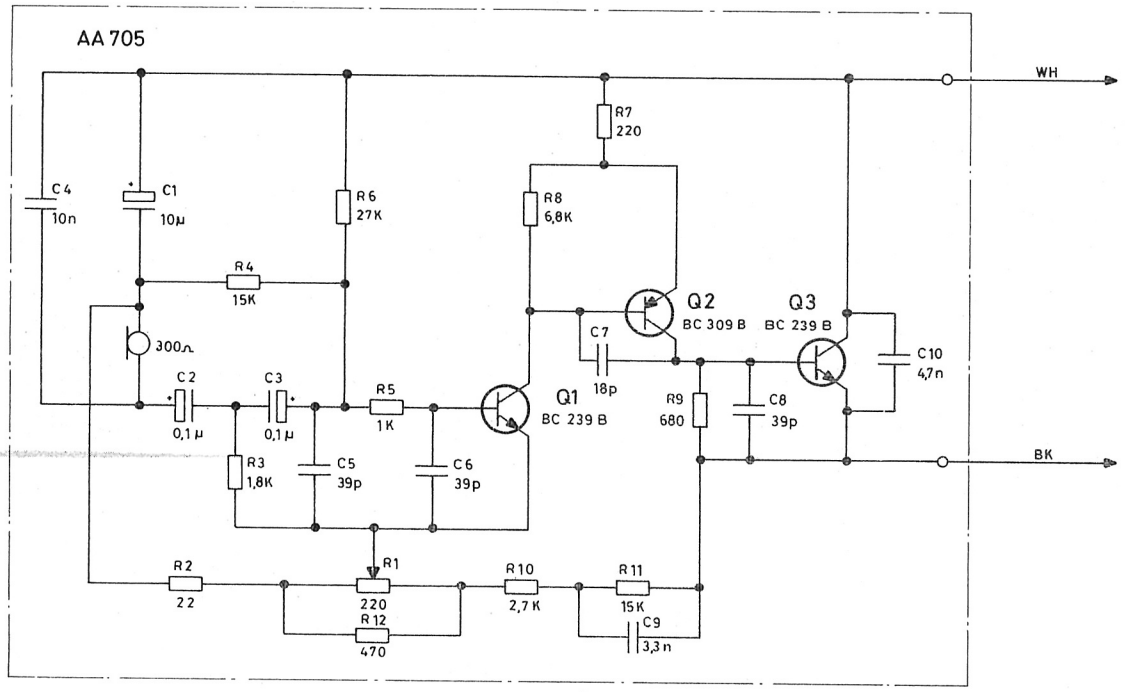
Storno

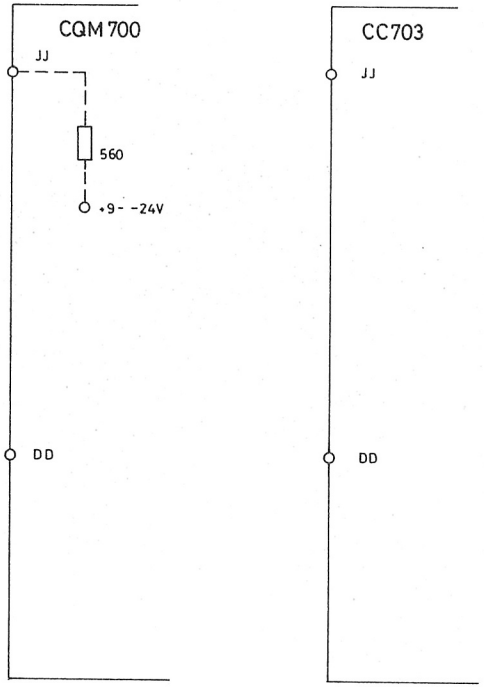
TYPE	Nº	CODE	DATA

LOUDSPEAKER WITH AMPLIFIER LS801

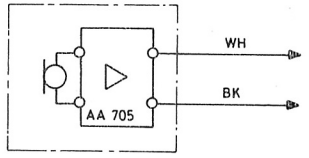
X402.432

Storno

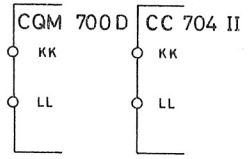




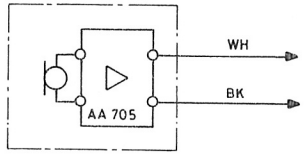
CQM 700 a



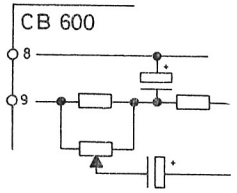
MC 704



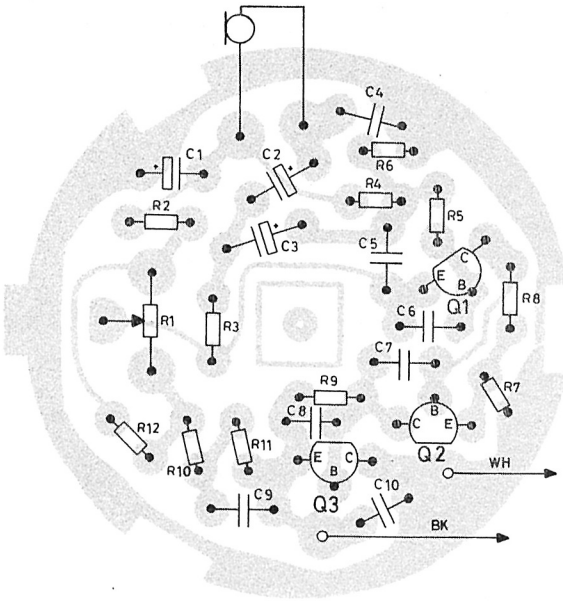
CQM 700 D



MC 704



CQM 600

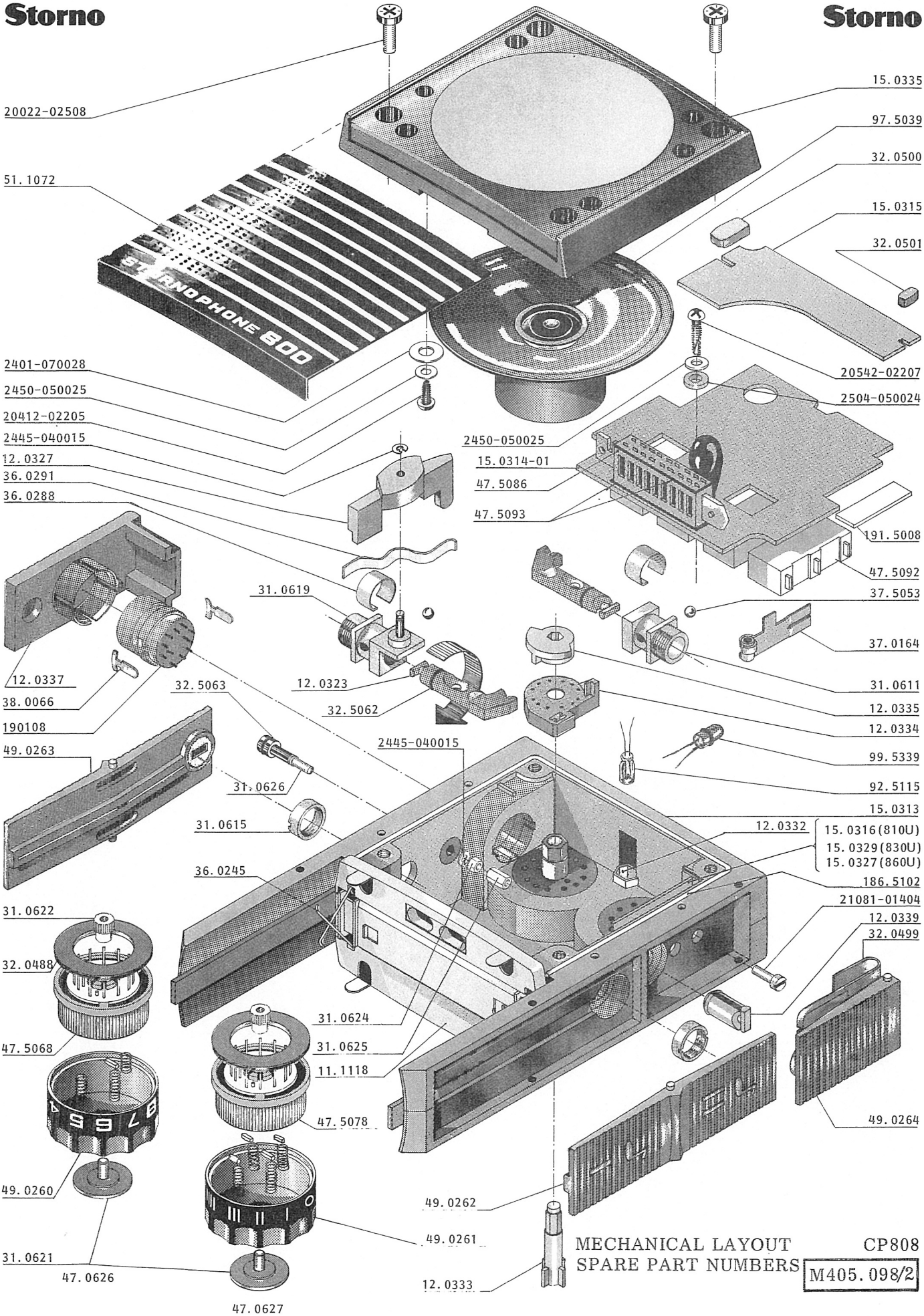


MICROPHONE MC 704
W. AMPLIFIER AA 705

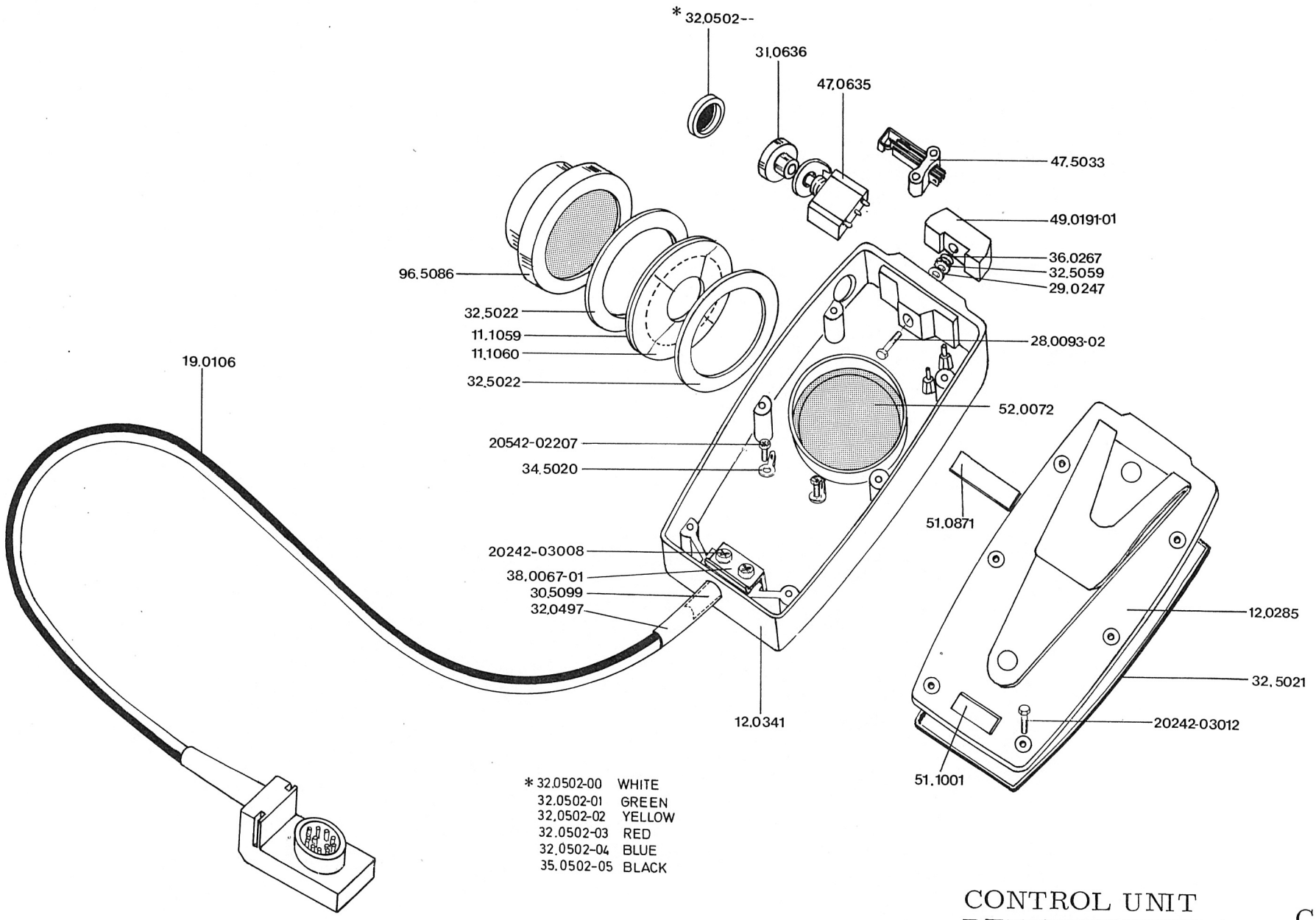
D402.666

Storno

Storno



Storno



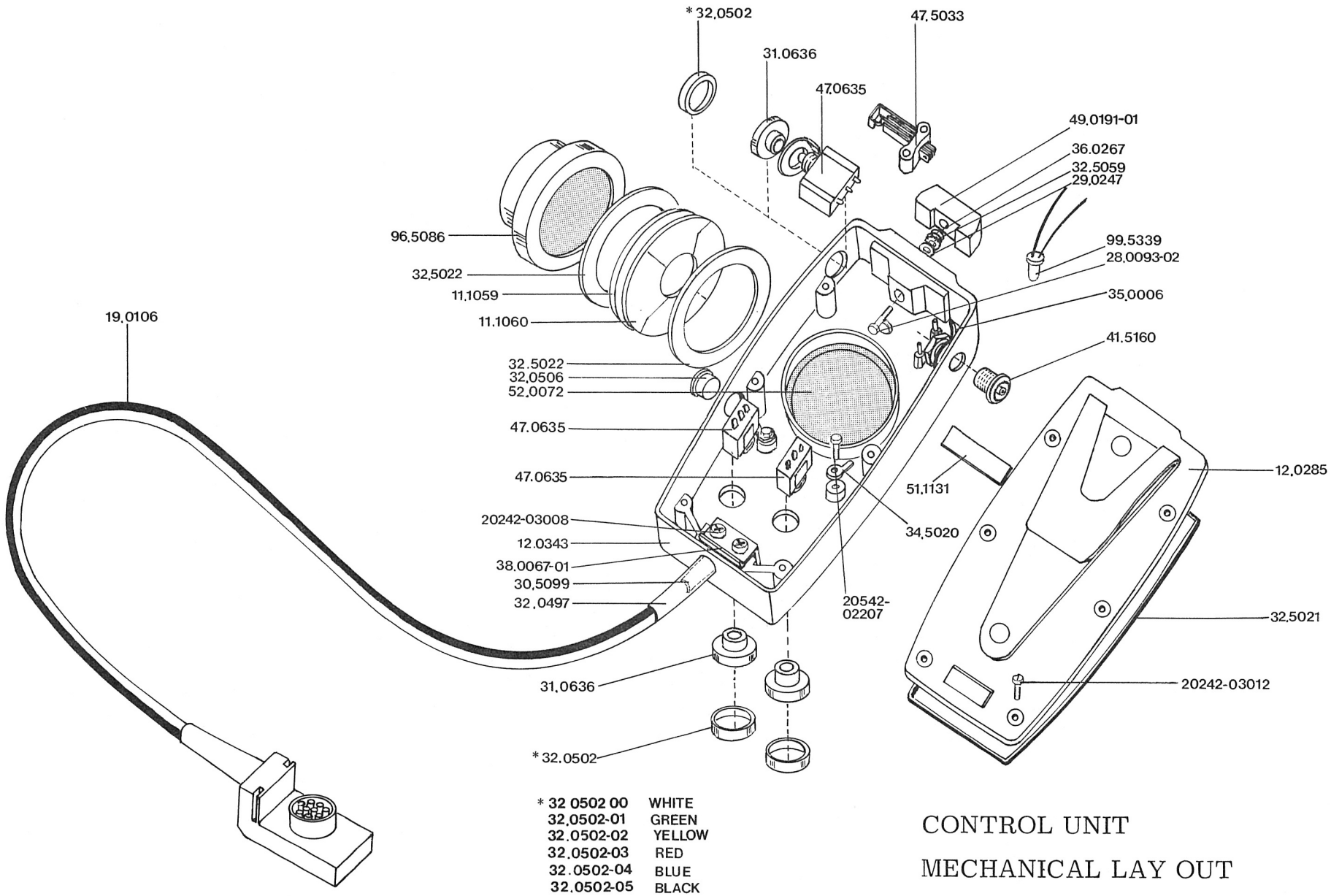
*	32.0502-00	WHITE
	32.0502-01	GREEN
	32.0502-02	YELLOW
	32.0502-03	RED
	32.0502-04	BLUE
	35.0502-05	BLACK

CONTROL UNIT
BETJENINGSENHED

CB804

M405.086/2

Storno



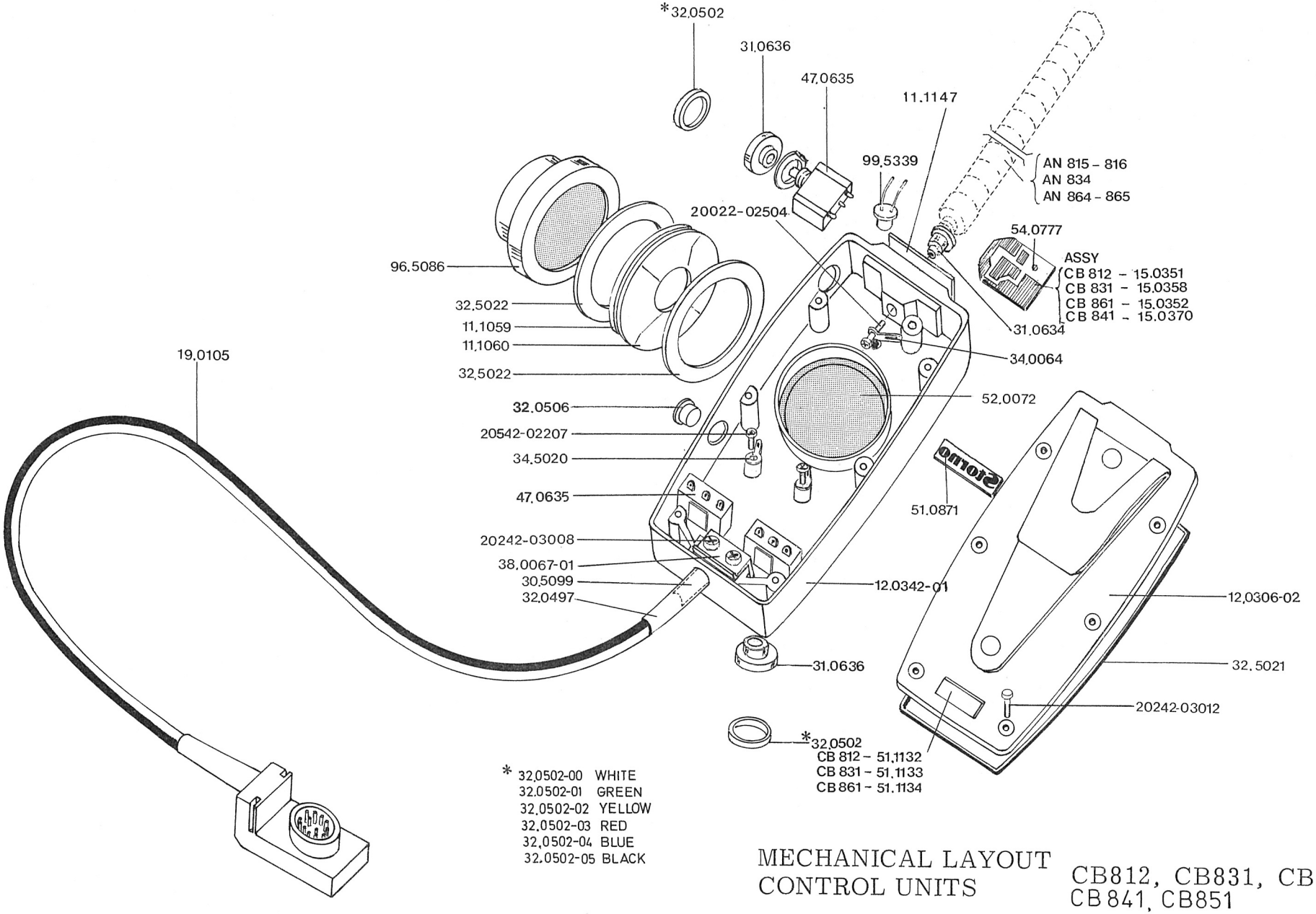
* 32 0502 00	WHITE
32,0502-01	GREEN
32,0502-02	YELLOW
32,0502-03	RED
32,0502-04	BLUE
32,0502-05	BLACK

CONTROL UNIT
MECHANICAL LAY OUT

CB805

M405.084/2

Storno



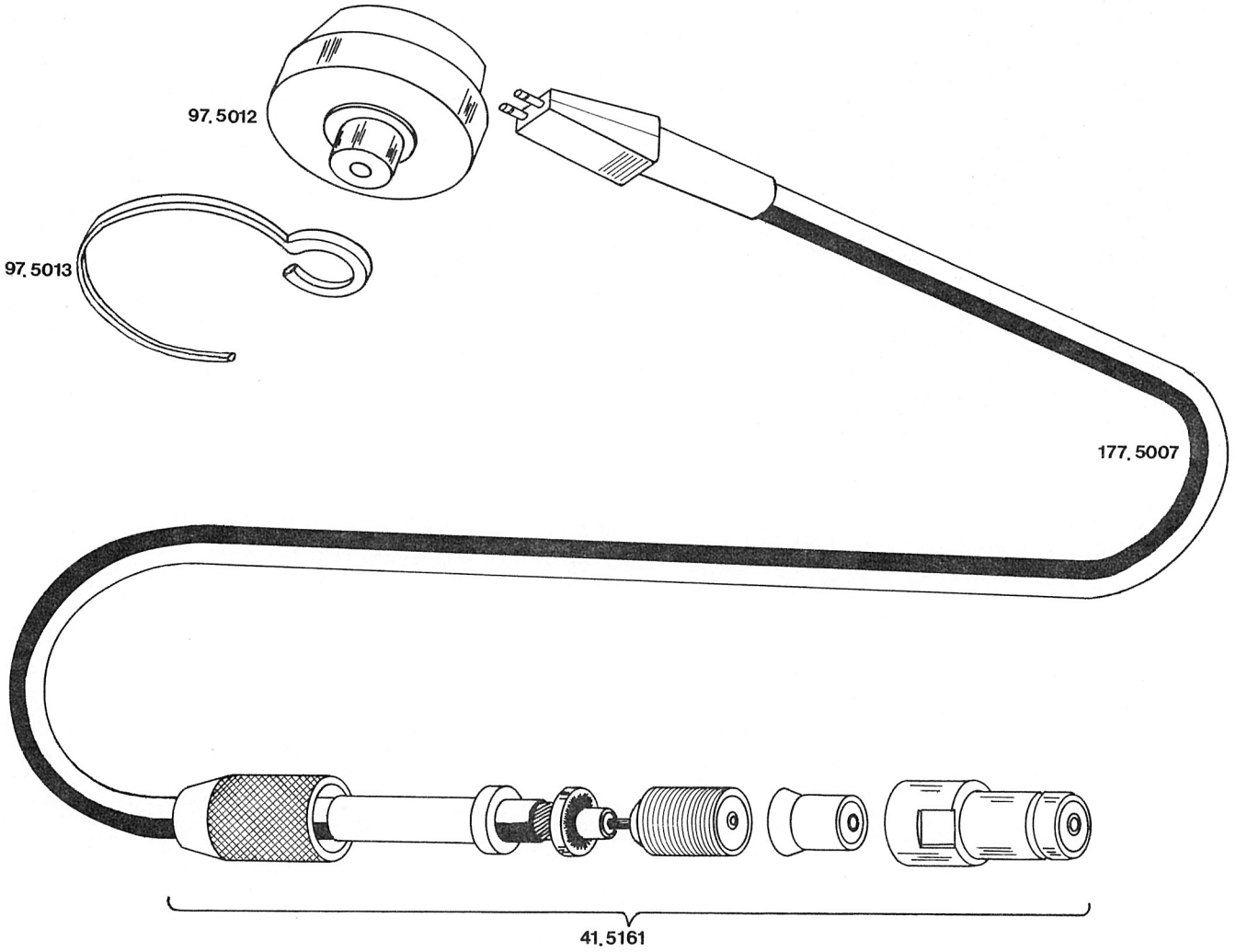
* 32.0502-00 WHITE
32.0502-01 GREEN
32.0502-02 YELLOW
32.0502-03 RED
32.0502-04 BLUE
32.0502-05 BLACK

MECHANICAL LAYOUT
CONTROL UNITS

CB812, CB831, CB861
CB841, CB851

M405.090/2

Storno



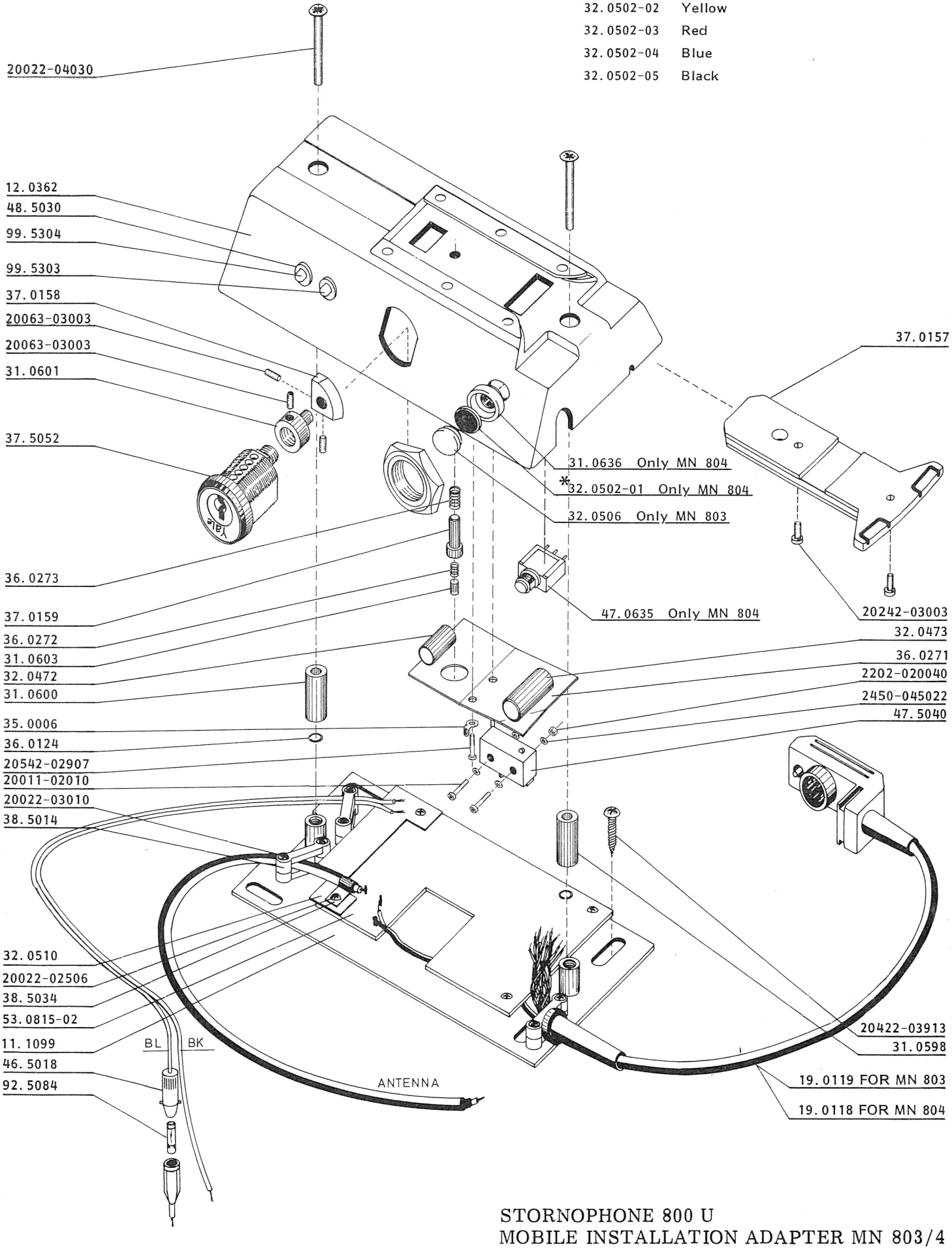
EARPHONE HP801

M405.079

Storno

Storno

*32.0502-01 Green
32.0502-02 Yellow
32.0502-03 Red
32.0502-04 Blue
32.0502-05 Black



STORNOPHONE 800 U
MOBILE INSTALLATION ADAPTER MN 803/4

M405.093/2

RC861

RF AMPLIFIER

MIXER

TRIPLER

XF 803 (20/25 KHz)

CRYSTAL FILTER 21.4 MHz

IC 801

IA 801

IA 802

IC1a

IC1b

TO TEST POINT 13

TO CP808 TERMINAL 21

+11 V RX

+7.5 V RX

TO PA861

XO 811 CHANNEL 2

XO 811 CHANNEL 1

VR 801

+7.5 V RX

SQ 801a

SQ ADJ

TO CHANNEL SELECTOR

CHANNEL 1

CHANNEL 2

CHANNEL 3

CHANNEL 4

CHANNEL 5

CHANNEL 6

CHANNEL 7

CHANNEL 8

CHANNEL 9

CHANNEL 10

CHANNEL 11

CHANNEL 12

CHASSIS

AA 802

FN 803 20/25 KHz

VR 801

+7.5 V TX

AD801

MC BLOCKING

TONE INPUT

DEV ADJ

GAIN ADJ

ADC ADJ

BW ADJ

-17 dBm

+7.5 VOLT TX

X 862 CHANNEL 2

XO 862

PM 861

FD 861

FD 862

FD 863

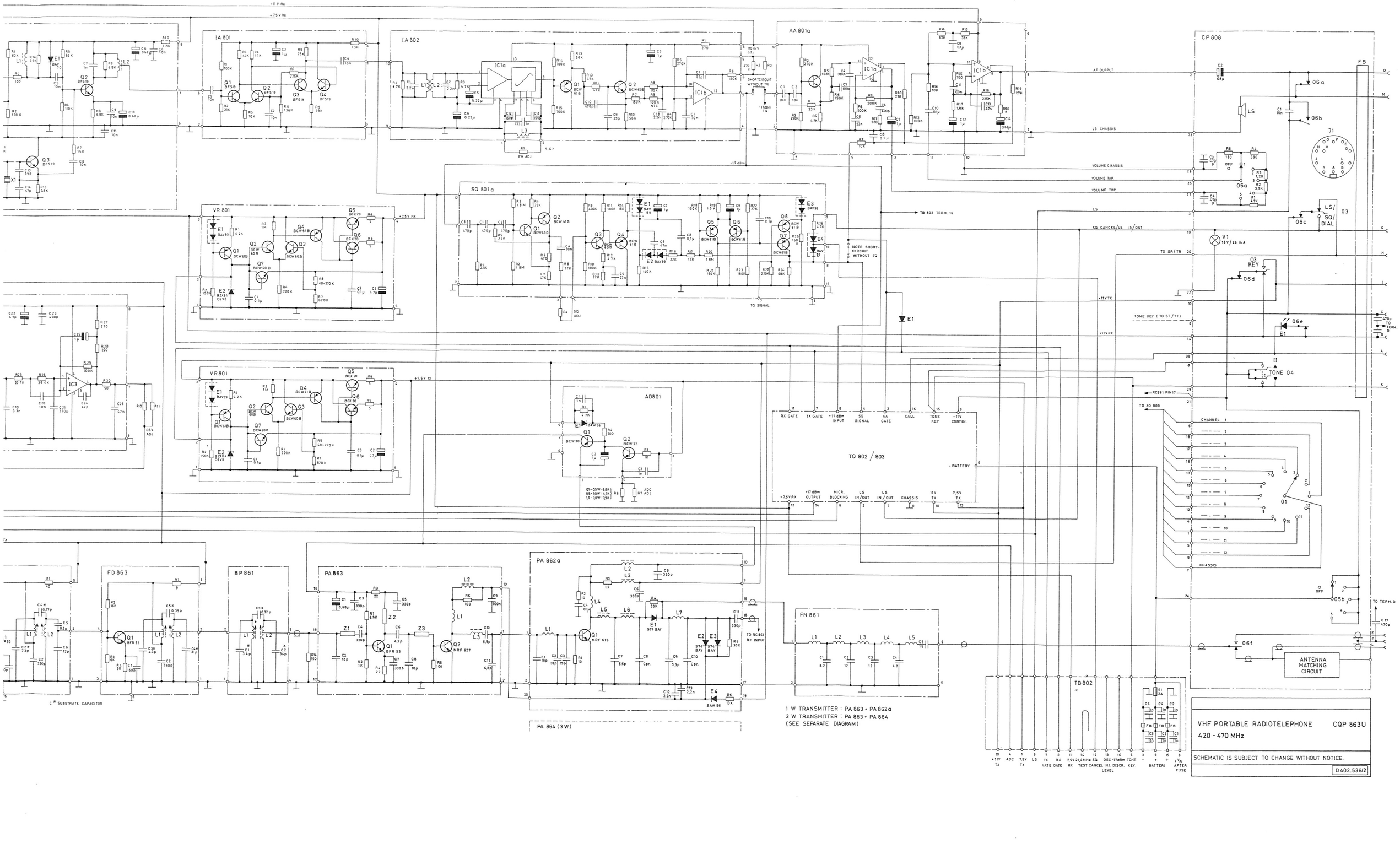
BP 861

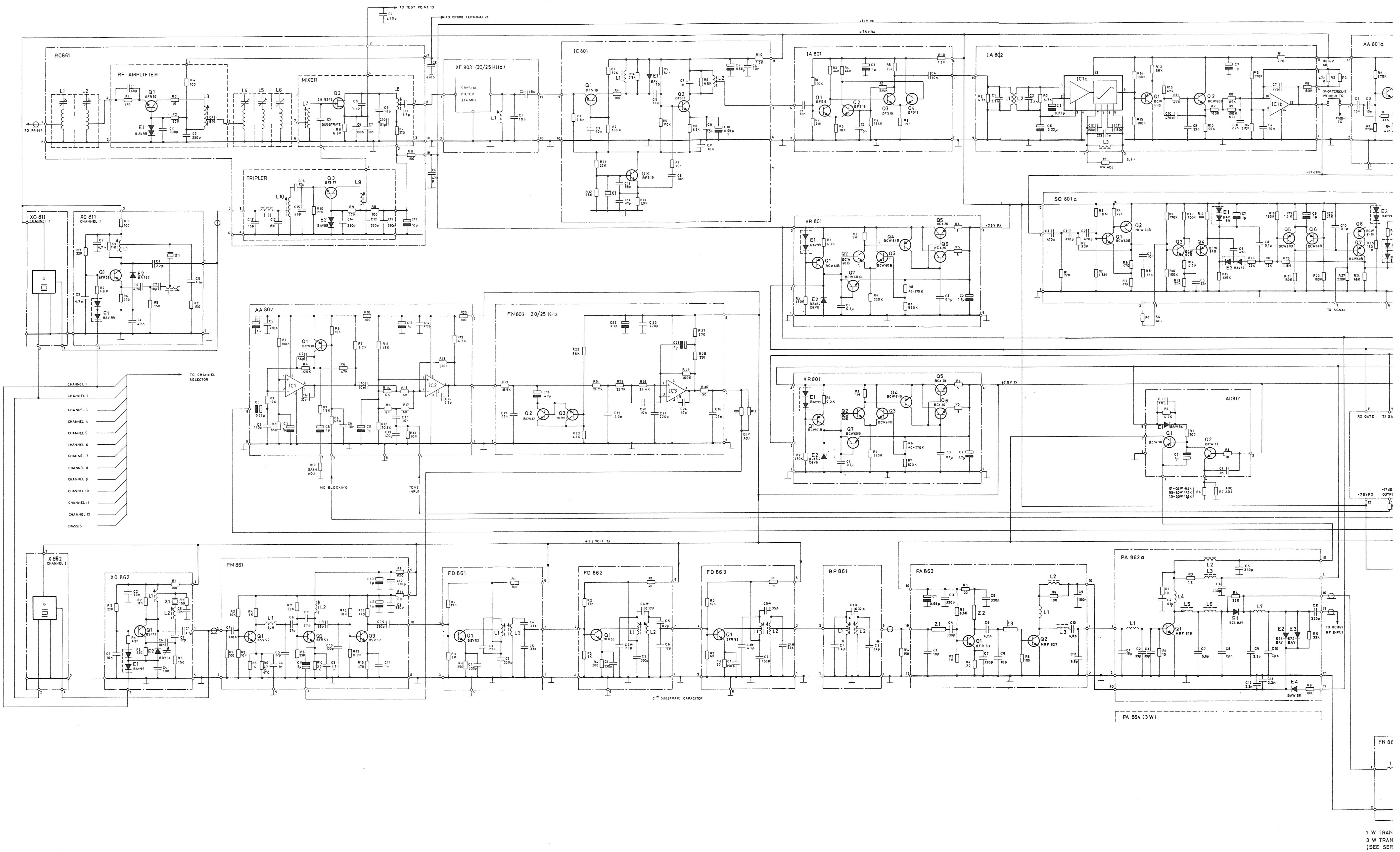
PA 863

PA 862a

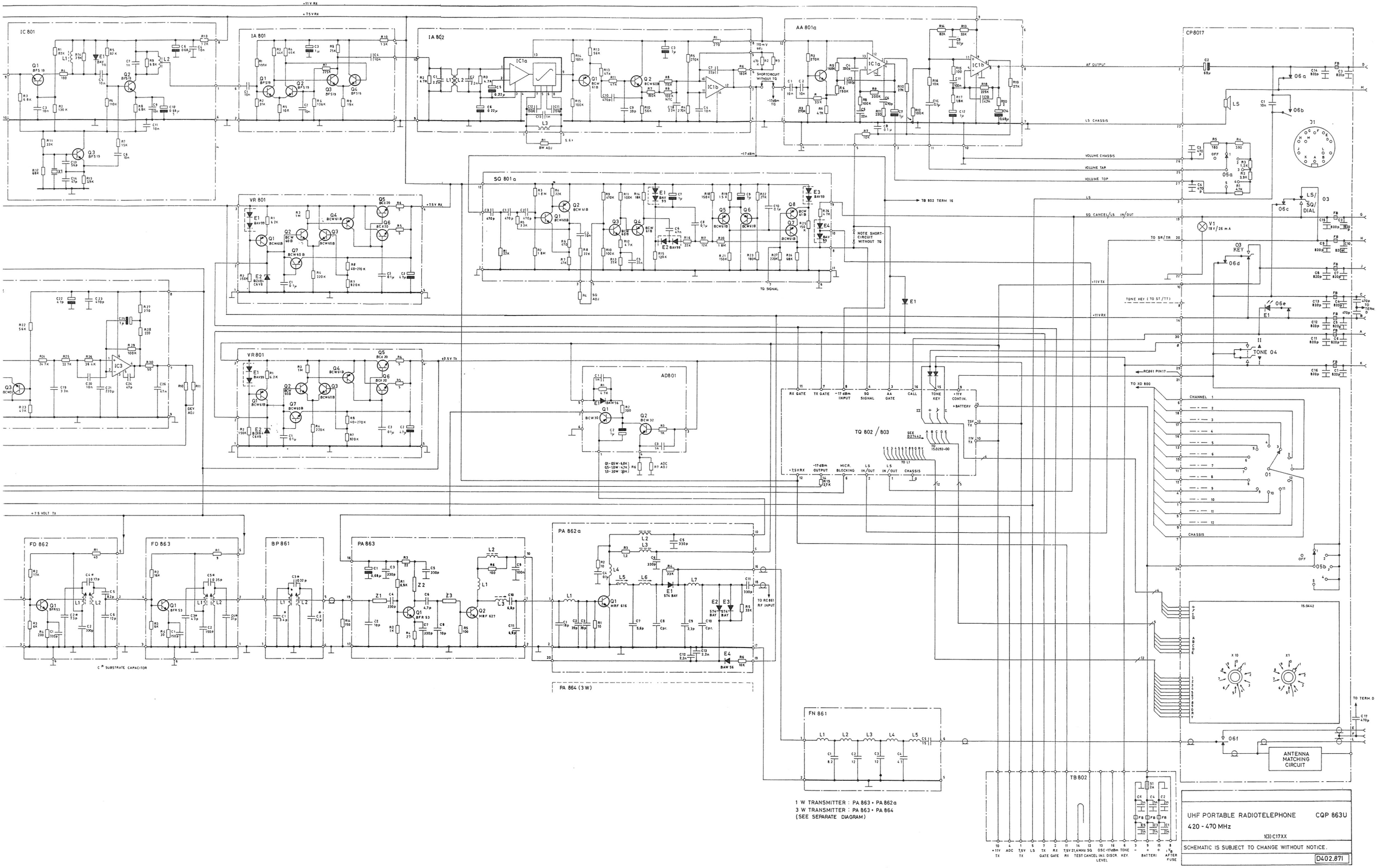
PA 864 (3W)

C* SUBSTRATE CAPACITOR

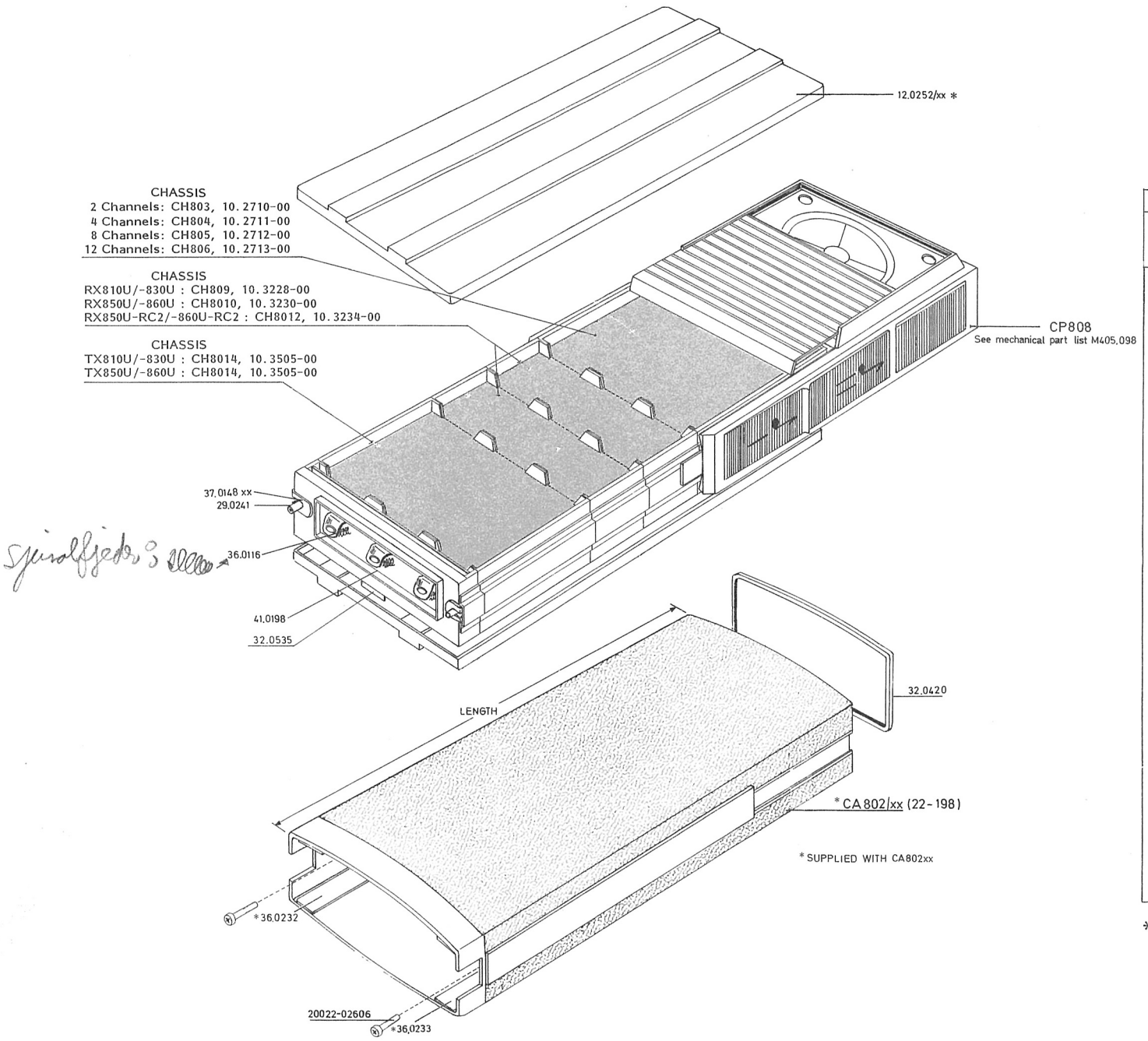

+11 V RX
+7.5 V RX
IA 801
IA 802
AA 801a
CP 808
AF OUTPUT
LS CHASSIS
VOLUME CHASSIS
VOLUME TAP
VOLUME TOP
LS
SQ CANCEL/LS IN/OUT
TO SR/TR
+11 V TX
TONE KEY (TO ST/TT)
+11 V RX
SHORT-CIRCUIT WITHOUT TQ
-17dBm TQ
-17 dBm
NOTE SHORT-CIRCUIT WITHOUT TQ
TQ SIGNAL
TB 802 TERM. 16
SQ 801 a
VR 801
+7.5 V TX
AD801
TQ 802 / 803
RX GATE
TX GATE
-17 dBm INPUT
SQ SIGNAL
AA GATE
CALL
TONE KEY
+11 V CONTIN.
+ BATTERY
+7,5 V RX
-17 dBm OUTPUT
MICR. BLOCKING
LS IN/OUT
LS IN/OUT
CHASSIS
11 V TX
7,5 V TX
RC 861 PIN 17
TO XO 800
CHANNEL 1
CHASSIS
TONE 04
FB
LS
LS/ SQ/ DIAL
03
V1 18 V/26 mA
03 KEY
06a
06b
06c
06d
06e
06f
J1
05a
05b
01
TO TERM. D
ANTENNA MATCHING CIRCUIT
FD 863
BP 861
PA 863
PA 862a
PA 864 (3 W)
FN 861
TB 802
C* SUBSTRATE CAPACITOR
1 W TRANSMITTER : PA 863 + PA 862a
3 W TRANSMITTER : PA 863 + PA 864
(SEE SEPARATE DIAGRAM)
10 +11 V TX
4 ADC
1 7,5 V TX
5 LS
7 TX GATE
2 RX GATE
11 7,5 V RX
14 21,4 MHz TEST
12 SQ CANCEL
13 INJ. LEVEL
16 OSC -17 dBm DISCR.
6 TONE KEY
3 -
9 BATTERI
15 +
8 +VB AFTER FUSE
VHF PORTABLE RADIOTELEPHONE
CQP 863U
420 - 470 MHz
SCHEMATIC IS SUBJECT TO CHANGE WITHOUT NOTICE.
D402.536/2



TO TEST POINT 13
TO CP808 TERMINAL 21
+11 V RX
+7.5 V RX
RC861
RF AMPLIFIER
MIXER
TRIPLER
TO PA861
XF 803 (20/25 KHz)
CRYSTAL FILTER
IC 801
IA 801
IA 802
AA 801a
SHORTCIRCUIT WITHOUT TQ
BW ADJ
XO 811 CHANNEL 2
XO 811 CHANNEL 1
VR 801
SQ 801a
SQ ADJ
TQ SIGNAL
AA 802
GAIN ADJ
MIC BLOCKING
TONE INPUT
FN 803 20/25 KHz
DEV ADJ
VR 801
AD801
ADC ADJ
RX GATE
TO CHANNEL SELECTOR
CHANNEL 1
CHANNEL 2
CHANNEL 3
CHANNEL 4
CHANNEL 5
CHANNEL 6
CHANNEL 7
CHANNEL 8
CHANNEL 9
CHANNEL 10
CHANNEL 11
CHANNEL 12
CHASSIS
+7.5 VOLT TX
X 862 CHANNEL 2
XO 862
PM 861
FD 861
FD 862
FD 863
BP 861
PA 863
PA 862a
TO RC861 RF INPUT
C* SUBSTRATE CAPACITOR
PA 864 (3W)


IC 801
IA 801
IA 802
AA 801a
CP8017
SQ 801a
VR 801
AD801
TQ 802 / 803
TB 802
FD 862
FD 863
BP 861
PA 863
PA 862a
PA 864 (3 W)
FN 861
TONE 04
ANTENNA MATCHING CIRCUIT
UHF PORTABLE RADIOTELEPHONE CQP 863U
420 - 470 MHz
1(3) C17XX
SCHEMATIC IS SUBJECT TO CHANGE WITHOUT NOTICE.
D402.871
1 W TRANSMITTER : PA 863 + PA 862a
3 W TRANSMITTER : PA 863 + PA 864
(SEE SEPARATE DIAGRAM)

Storno



CASING				
LENGTH IN MM.	CASING TYPE	ASSY. CODE NO.	JUNCTION RAIL CODE NO.	* INSULATING SET CODE NO.
61.25	CA802-22	10.3600-01	37.0148-01	12.0251-45
65.25	CA802-26	10.3600-02	37.0148-02	-- " --
69.25	CA802-30	10.3600-03	37.0148-03	-- " --
73.25	CA802-34	10.3600-04	37.0148-04	-- " --
77.25	CA802-38	10.3600-05	37.0148-05	-- " --
81.25	CA802-42	10.3600-06	37.0148-06	-- " --
85.25	CA802-46	10.3600-07	37.0148-07	-- " --
89.25	CA802-50	10.3600-08	37.0148-08	-- " --
93.25	CA802-54	10.3600-09	37.0148-09	-- " --
97.25	CA802-58	10.3600-10	37.0148-10	-- " --
101.25	CA802-62	10.3600-11	37.0148-11	-- " --
105.25	CA802-66	10.3600-12	37.0148-12	-- " --
109.25	CA802-70	10.3600-13	37.0148-13	-- " --
113.25	CA802-74	10.3600-14	37.0148-14	-- " --
117.25	CA802-78	10.3600-15	37.0148-15	-- " --
121.25	CA802-82	10.3600-16	37.0148-16	-- " --
125.25	CA802-86	10.3600-17	37.0148-17	-- " --
129.25	CA802-90	10.3600-18	37.0148-18	-- " --
133.25	CA802-94	10.3600-19	37.0148-19	-- " --
137.25	CA802-98	10.3600-20	37.0148-20	-- " --
141.25	CA802-102	10.3600-21	37.0148-21	-- " --
145.25	CA802-106	10.3600-22	37.0148-22	-- " --
149.25	CA802-110	10.3600-23	37.0148-23	-- " --
153.25	CA802-114	10.3600-24	37.0148-24	-- " --
157.25	CA802-118	10.3600-25	37.0148-25	-- " --
161.25	CA802-122	10.3600-26	37.0148-26	-- " --
165.25	CA802-126	10.3600-27	37.0148-27	-- " --
169.25	CA802-130	10.3600-28	37.0148-28	-- " --
173.25	CA802-134	10.3600-29	37.0148-29	-- " --
177.25	CA802-138	10.3600-30	37.0148-30	-- " --
181.25	CA802-142	10.3600-31	37.0148-31	-- " --
185.25	CA802-146	10.3600-32	37.0148-32	-- " --
189.25	CA802-150	10.3600-33	37.0148-33	-- " --
193.25	CA802-154	10.3600-34	37.0148-34	-- " --
197.25	CA802-158	10.3600-35	37.0148-35	-- " --
201.25	CA802-162	10.3600-36	37.0148-36	-- " --
205.25	CA802-166	10.3600-37	37.0148-37	-- " --
209.25	CA802-170	10.3600-38	37.0148-38	-- " --
213.25	CA802-174	10.3600-39	37.0148-39	-- " --
217.25	CA802-178	10.3600-40	37.0148-40	-- " --
221.25	CA802-182	10.3600-41	37.0148-41	-- " --
225.25	CA802-186	10.3600-42	37.0148-42	-- " --
229.25	CA802-190	10.3600-43	37.0148-43	-- " --
233.25	CA802-194	10.3600-44	37.0148-44	-- " --
237.25	CA802-198	10.3600-45	37.0148-45	-- " --

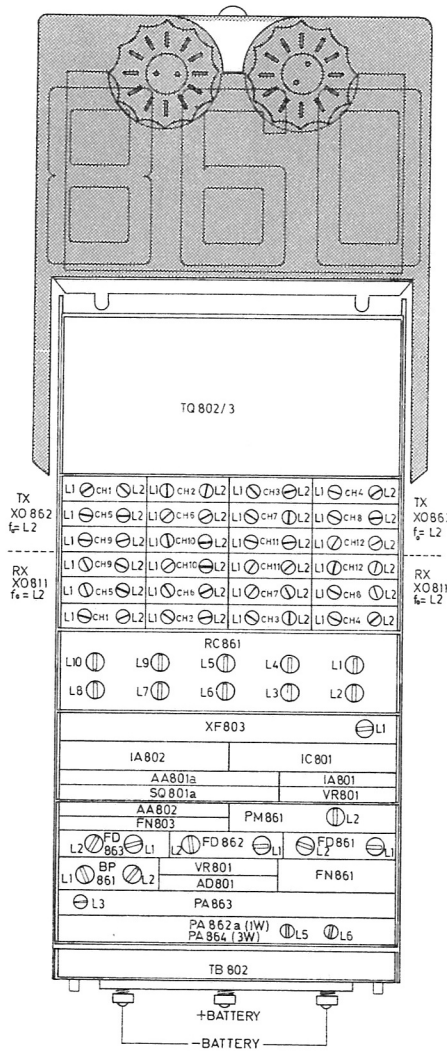
* Insulating set's length trimmed according to the casing type.

STORNOPHONE 800 U
MECHANICAL LAYOUT

M405.088/3

Storno

ALIGNMENT CARD CQP800U



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