

Service Manual

**MAXON**

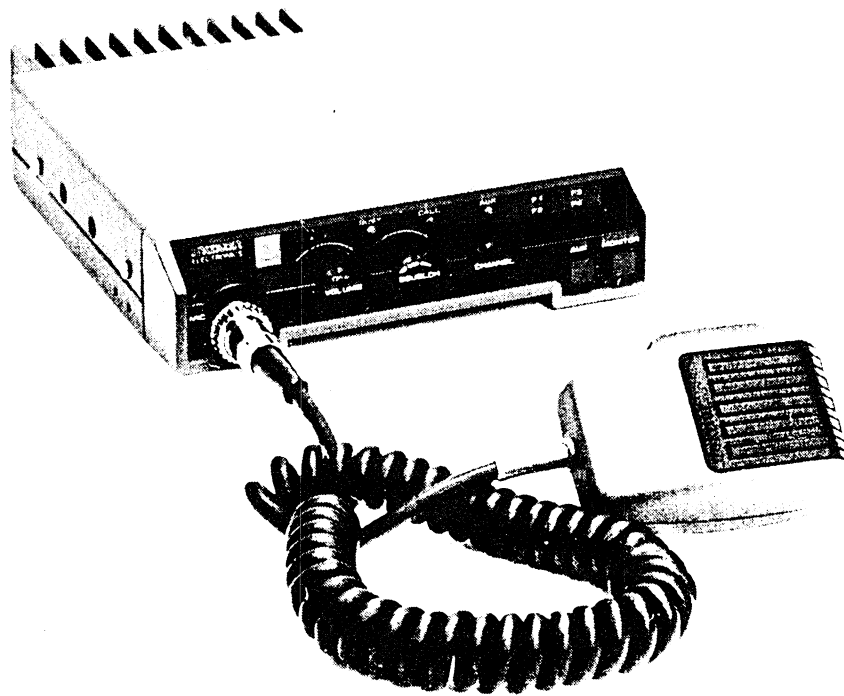
VHF MOBILE TRANSCEIVER

CGX 4010N SERIES

# ***Betjeningsvejledning***

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**maxon**

**CGX 4010 mobilstation**

## Installation:

Maxon CGX 4010 er beregnet til montering i køretøjer med 12 volt og minus til stel, i 24 volts køretøjer er spændingsdeler nødvendig. Benyttes apparatet som basestation med basemodulet MS-0720, se vejledningen til denne. Benyt bøsning: **O**.

Benyt ikke apparatet før en korrekt tilpasset antenne er tilsluttet bøsningen: **P**.

**Aktiveres senderen uden antenne, kan det medføre beskadigelser.**

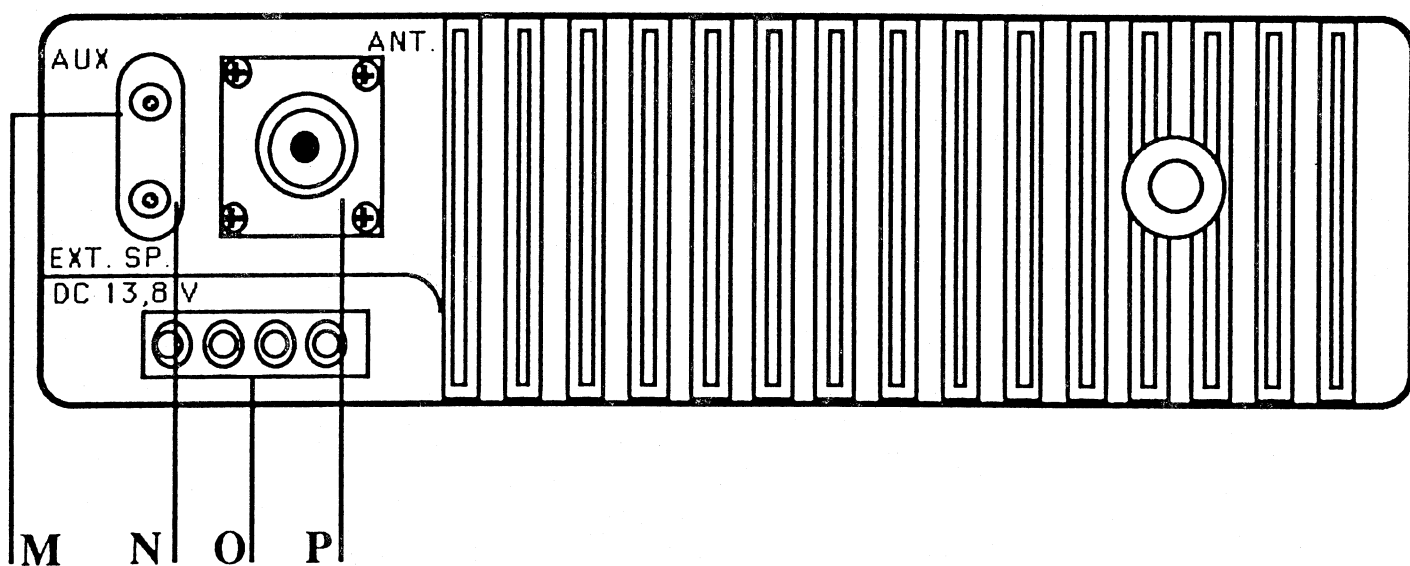
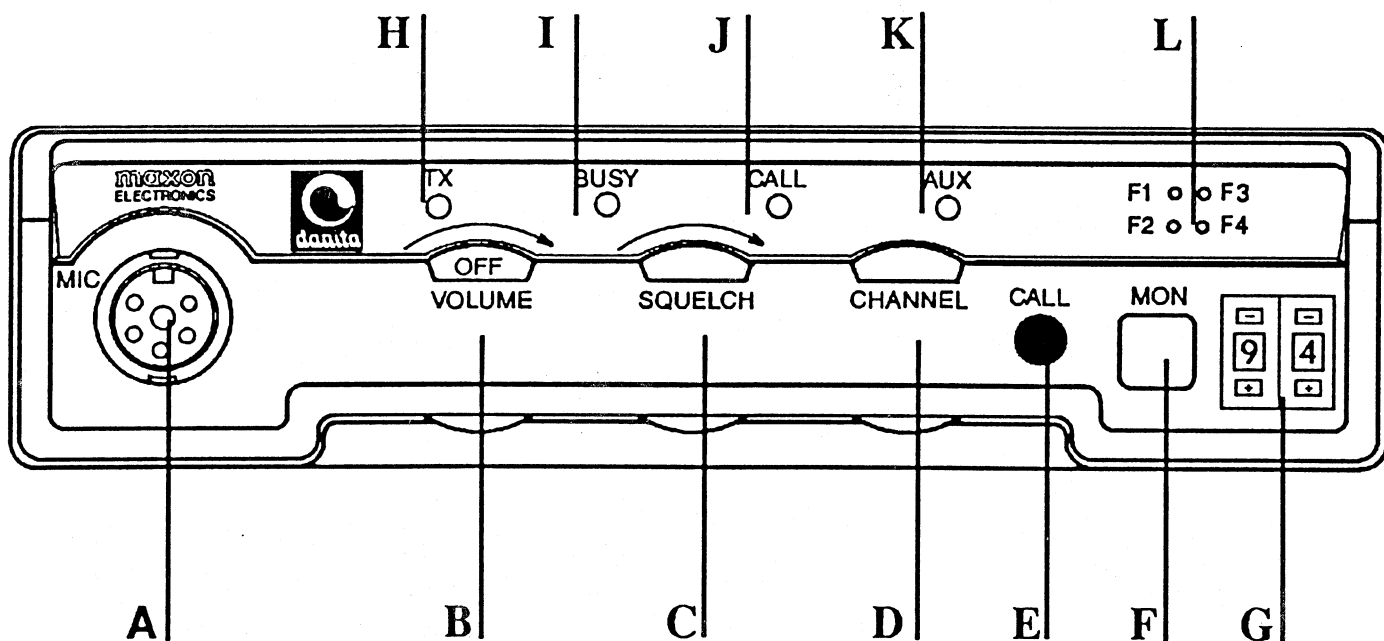
## Betjening:

Tilslut den medfølgende mikrofon i bøsningen: **A**. Tænd stationen og juster til ønsket styrke med kontrollen: **B**. Drej kontrollen: **C** med uret til baggrundsstøjen lige netop forsvinder. Vælg den ønskede kanal med omskifteren: **D**. (indikeres med lysdiode: **L**.) Stationen er nu klar til at modtage opkald. Ønsker man selv at foretage opkald, (kontroller på lysdioden: **I** om kanalen er ledig) trykkes sendetasten ind på mikrofonen og opkaldet foretages. Lysdioden: **H** viser når apparatet er i sendestilling. Husk: tryk og tal / slip og lyt.

### Specielt for apparater forsynet med selektivt opkald:

Ved opkald: tryk på knappen: **F** til lampen: **K** slukker. Vælg den ønskede modtager på omskifteren: **G** og kald med call-knappen: **E**. Når opkaldet besvares indledes samtalen som anført ovenfor (tryk og tal/slip og lyt).

Før modtagelse af opkald: knappen: **F** skal aktiveres til lampen: **K** lyser. Apparatet er nu klar til at modtage et opkald. Når korrekt opkald modtages, høres biptone fra den indbyggede højttaler i ca. 20 sek. og lampen: **J** lyser konstant til opkaldet besvares. (lampen: **J** slukker ved tryk på mikrofonens sendetast). For at gøre stationen klar til at modtage nyt opkald, trykkes knappen: **F** ud til lampen: **K** slukker og derefter ind igen til lampen: **K** atter lyser. Apparatet er nu i "stand-by" og klar til modtagelse af nyt opkald.



**A:** Mikrofontilslutning.

**B:** Tænd/sluk og volumekontrol.

**C:** Støjbegrenserkontrol.

**D:** Kanalomsifter.

**E:** Opkaldsknap (hvis monteret).

**F:** Højttaler til/fra.

**G:** Opkaldsvælger (hvis monteret).

**H:** Indikator for sendefunktion.

**I:** Indikator for optaget kanal.

**J:** Indikator for modtaget opkald.

**K:** Indikator for AUX tilslutning.

**L:** Indikatorer for valgt kanal.

**M:** AUX tilslutning.

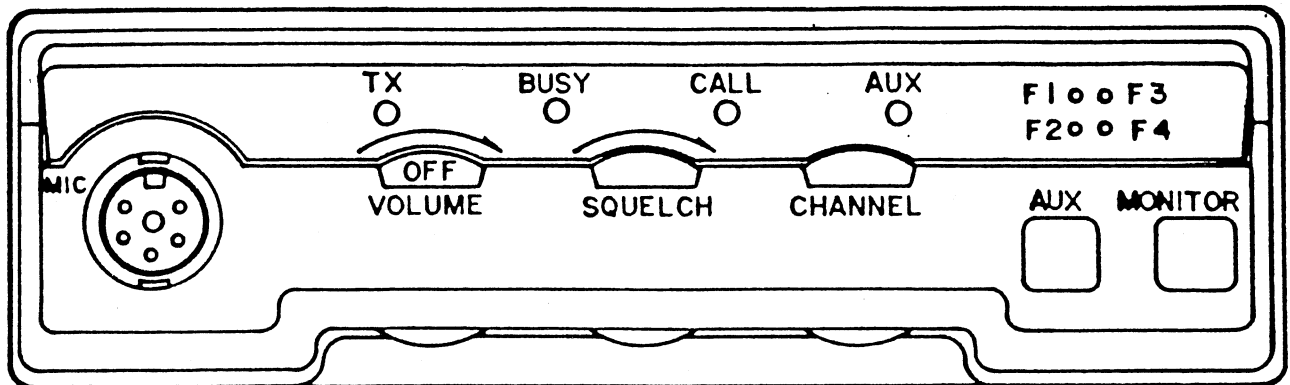
**N:** Udgang for ekstra højttaler.

**O:** Indgang for 12 v DC (autobatteri).

**P:** Antenne tilslutning.

# MAXON CGX-4010-N VHF MOBILE

## Description of Controls



### CONTROLS AND SWITCHES

**ON/OFF VOLUME CONTROL** – This is the main power switch and volume control.

**SQUELCH CONTROL** – The squelch control will silence the receiver when no signal is being received.

**CHANNEL SELECT SWITCH** – Selects channels F1 or F2 or F3 or F4.

**AUX SWITCH** – Silences internal speaker and connects the Auxiliary Speaker or can be used for Selective Call System.

**MONITOR SWITCH** – This is a Tone coded squelch system defeat switch.

### INDICATORS

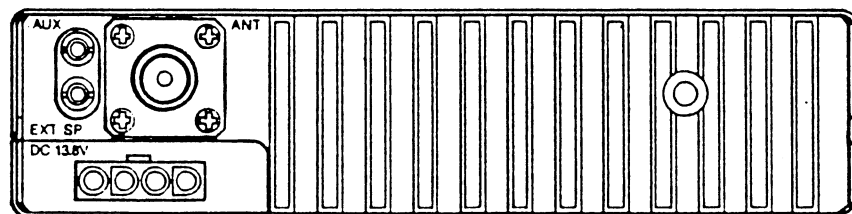
**TX INDICATOR** – A red Light Emitting Diode (LED) indicator, glows when transmitting.

**BUSY CHANNEL INDICATOR** – A yellow LED, glows when there is activity on channel.

**AUX INDICATOR** – The yellow LED will light when the Auxiliary Speaker Switch is engaged, or selective call system is operated.

**CALL LIGHT INDICATOR** – Functions only when a two-tone or five-tone decoder is installed. The green LED will glow only when a signal addressed to the mobile has been received.

### DESCRIPTION OF CONNECTORS—BACK



### Connectors

**ANTENNA CONNECTOR** – SO-239 type connector, output is 50 ohms and must be connected to a properly installed 50 ohm antenna.

**EXTERNAL SPEAKER CONNECTOR** – A 3.5mm diameter jack is provided for a 4 ohm external speaker. The internal speaker is silenced when the external speaker is connected.

**AUX SPEAKER CONNECTOR** – A 3.5mm diameter jack for a 4 ohm Auxiliary Speaker or other Auxiliary equipment.

**DC 13.2V** – Polarized plug: 13.2 volt DC input for **NEGATIVE GROUND SYSTEM ONLY**.

GENERAL SPECIFICATIONS

Power Source .....	Vehicle Battery - nominal 13.2 volts negative earth only.
Temperature .....	-30 degrees centigrade to +60 degrees centigrade
Antenna Impedance .....	50 ohms unbalanced
External Speaker Impedance .....	4 ohm
Frequency Control .....	Quartz Crystal
Frequencies of operation .....	148 MHz - 174 MHz
Receiver and transmitter performance bandwidth without adjustment .....	2.0 MHz
Frequency tolerance and stability .....	+/- 0.001%
Channel Spacing .....	12.5 KHz
High Humidity .....	90%
Vibration Stability .....	EIA RS-388, Sec, 3, 2, 4
Shock Stability .....	EIA RS-388, Sec, 3, 2, 5
Channel capability .....	Up to 4 channels transmit/ receive
Nominal dimensions .....	45mm (H) x 180mm (W) x 225mm (D)
Weight .....	2Kg

RECEIVER PERFORMANCE SPECIFICATIONS

Refer to MPT1301 or MPT1326 for methods of measurement.

Sensitivity .....	12 dB SINAD 0.35 uV
Sensitivity noise quieting .....	20 dB 0.5 uV
Squelch sensitivity .....	Threshold . 0.25uV Max. or 6 dB SINAD Tight .. within + 10dB to 20 DB from the threshold
Squelch blocking .....	10 dB
Receiver attack time .....	150 ms
Receiver squelch closing time .....	250 ms
Modulation acceptance band width .....	4.0 KHz Min
Adjacent channel two signal selectivity and desensitization .....	70 dB
Spurious response attenuation .....	70 dB
Intermodulation spurious response attenuation .....	70 dB
Audio power output .....	5W at 10% THD Max.
Audio Frequency response .....	6 dB/octave de-emphasis in range 300 - 3000Hz
Hum and Noise (Unsquelled) .....	45 dB
Undesired conducted RF power 0-2000MHz .....	2nW max
Undesired radiated power 0-2000MHz .....	2nW max
Standby current (receive) .....	150mA Max

TRANSMITTER PERFORMANCE SPECIFICATIONS

Refer to MPT1301 for methods of measurement.

Carrier power output .....	25W nominal
Modulation system .....	FM
Audio Frequency response .....	6 dB/octave pre-empahsis in range 300 - 3000Hz
Audio frequency Harmonic distortion .....	5% at 1KHz for +/-1.5KHz deviation
System deviation .....	+/- 2.5 KHz Maximum
Modulation limiting .....	Instantaneous peak clipping with low pass audio filter
Occupied bandwidth .....	Less than -65dB from carrier power +/-12.5KHz
Conducted spurious emissions .....	0.25 microwatt
Radiated harmonic emissions .....	0.25 microwatt
Output protection .....	Shall withstand for 5 minutes all VSWR around Smith chart of 20:1 without failure or damage
Output stability .....	Shall not exceed spurious emission requirements when operated into a mis-match load with 5:1 VSWR at any point on the Smith Chart.
Current .....	4.5 A max

CRYSTAL SPECIFICATIONS

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Transmitter (Specification no. MG11T)

Holder .....	HC -43/u or Hc -49/u wire lead
Mode of oscillation .....	Fundamental
Load capacity .....	32 pF parallel
Series resistance .....	Less than 15 ohms
Drive level .....	Less than 0.5 mW
Holder Capacity .....	7 pF Max
Motional Capacity .....	0.025 pF +/- 10%
Temperature range (operating) .....	-30 degrees centigrade to +60 degrees centigrade
Frequency tolerance at 25 degrees centigrade .....	+/- 10ppm
Frequency tolerance vs temperature .....	+/- 5 ppm, -10 degrees centigrade to +60 degrees centigrade (+0 ppm to -20 ppm at -30 degrees centigrade)
Frequency calculation .....	Operating frequency divided by 9

Receiver (Specification no. MG11R)

Holder .....	HC -43/u or HC -49/u wire lead
Mode of oscillation .....	Fundamental
Load capacity .....	32 pF parallel
Series resistance .....	Less than 15 ohms
Drive level .....	Less than 0.5 mW
Holder capacity .....	7 pF Max
Temperature range (operating) .....	-30 degrees centigrade to +60 degrees centigrade
Frequency tolerance at 25 degrees centigrade .....	+/- 10 ppm
Frequency calculation .....	(Fo - 10.7)/9
Frequency tolerance vs temperature .....	+/- 5 ppm -10 degrees centigrade to +6 degrees centigrade(+0 ppm to -20 ppm at -30 degree's centigrade).
Motional capacity .....	0.025pF +/- 10%

Note

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Transmit/Receive Frequency information should preferably be printed on top edge  
of metal can.

THEORY OF OPERATION  
Refer to Schematic diagram

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2.1. RECEIVER

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2.1.1. RF AMPLIFIER

Q1 is an RF amplifier. A low noise, high gain dual MOSFET transistor is used to ensure excellent sensitivity and its input and output are tuned by a total of four tuning elements to obtain good band pass characteristics.

2.1.2. MIXER AND 10.7MHz IF

Q2 is a Junction FET used as a mixer to minimise intermodulation. Q2 output is filtered by a four pole monolithic filter and then amplified by Q3.

2.1.3. LOCAL OSCILLATOR

Q4 is a fundamental mode crystal oscillator. Its output is fed to the first tripler stage Q5/T6/T7. This signal then drives a further tripler Q6. Q6 output is double tuned to minimise spurious response of the receiver. The filtered local output is injected into the source of Q2, a J-FET Mixer. C58 and thermistor TH1 compensate for crystal temperature drift.

2.1.4. SECOND MIXER AND 455 KHz IF

IC-1 (MC3357) is an important part of the receiver. The IC first converts Q3's output into a 455KHz signal by its internal mixer and a crystal oscillator. Its 455 KHz output comes out of PIN 3, and is filtered by CF-1. The IC also has a high gain amplifier and a limiter and then detects FM signals by a quadrature detector which is tuned by T10. The detector audio appears on PIN 9, and a portion of the noise is filtered and fed back into the internal noise amplifier whose output is rectified by D1 and D2. This DC voltage is used to control the squelch circuit which turns on Q8.

2.1.5. AUDIO AMPLIFIER

IC2 (KIA7222AP) is an audio amplifier which produces 2W of power into the internal 8 ohm loudspeaker or 5W into an external 4 ohm loudspeaker.

2.1.6. RECEIVER SWITCHING

Q10 is a voltage regulator which supplies a stable voltage to all receiver circuitry against the variation of power supply voltage. D11 is a switching diode to disable Q10. D301 and D302 provide r.f. switching which protects Q1 input on transmit.



#### 2.2.5. R.F. POWER AMPLIFIER

The single stage r.f. power amplifier uses Q301 (MRF1946) to boost the output to approx. 5.0W. R301/302/303 form a pi-attenuator to set the overall stage gain. The output stage is coupled to the antenna socket by a multi-section pi-filter to reduce harmonic radiation. The entire stage is broadbanded and requires no dealer adjustment.

#### 2.2.6. SWITCHING

Q21 is the transmit switching transistor. It is normally off in the receiver mode, but will be forward biased on transmit. Q16 is a voltage regulator to supply a stable voltage to Q14, Q15, Q22 and IC4.

When switched to receive mode, Q302 is switched off and Q303 is on, allowing the signal path into the receive stages.

In transmit mode, Q302 is on and Q303 is off which cuts off signal to the receiver via switching diodes D301 and D302.

### 3.1 RECEIVER ALIGNMENT

#### 1. CRYSTAL INSTALLATION

Install crystals at proper channel locations (switch positions 1 through 4). Soldering of the crystals must be accomplished quickly to avoid damage to the crystal itself.

#### 2. OSCILLATOR TUNING

Connect a VOM (0-3V range) at TP-2; tune T6 & T7 for maximum. Disconnect VOM.

#### 3. FRONT END TUNING

Turn squelch control full counter-clockwise and adjust volume control to approximately mid-position. Set the signal generator to the channel frequency, with 1KHz modulation and 1.5KHz deviation. Increase the RF level until a signal can be heard. Tune T6 - T9 for best SINAD. Tune T1 through T4 for maximum, reducing the signal generator output to avoid saturation. Retune T1 through T9 for best SINAD indication.

#### 4. CHANNEL SETTING

a) Adjust the relevant RX crystal trimmers for best SINAD.

OR b) Switch off signal generator modulation and adjust output level to just fully quieten the receiver. Inject a 10.7MHz signal to the 1st mixer/I.F. circuit. Adjust the relevant RX crystal trimmers for zero beat from loudspeaker.

## 3.2 RECEIVER PERFORMANCE TESTS

### 1. SINAD SENSITIVITY

Adjust the signal generator output to the lowest level which will provide a good sinusoidal pattern on the oscilloscope. At 20 dB SINAD the signal generator output should be less than 0.5uV.

### 2. NOISE QUIETING SENSITIVITY

With the signal generator disconnected from the radio and the squelch open, adjust the volume control to obtain a noise reading of 1V RMS on an AC VTVM connected to the speaker terminals. Reconnect the signal generator to the radio with no modulation and adjust the RF attenuator so that a reading of 0.1V is obtained. This is the 20 dB quieting point and it should be approximately 0.5 uV.

### 3. SQUELCH SENSITIVITY

With the signal generator set for 1KHz modulation, 1.5KHz deviation and the RF output at minimum, adjust the squelch control at its threshold. The squelch should open as the output of the signal generator is increased to 0.25 uV. Set the squelch control to its maximum clockwise position. Increase the RF attenuator setting until the squelch opens. The point of opening should be 10 to 20 dB greater than 0.25 uV.

### 4. AUDIO OUTPUT

With the signal generator set at 1000uV output, adjust the radio's volume control to display a clean sine wave on the oscilloscope just below the point at which clipping occurs. The AC VTVM connected across the speaker leads should read 4V (4.0 W at 1KHz into the 4-ohm load). The distortion analyzer should read 5% or less at this volume control setting.

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### 3.3 TRANSMITTER ALIGNMENT

#### 1. CRYSTAL INSTALLATION

Install Crystals at proper channel locations (switch positions 1 through 4). Soldering of the crystals must be accomplished quickly to avoid damage to the crystal itself.

#### 2. POWER SUPPLY VOLTAGE

Set the power supply voltage to 13.2 volts, measured at the radio, not at the power supply. If measured at the power supply, voltage drop in the connecting leads with result in erroneous readings.

#### 3. MULTIPLIER TUNING

Connect a VOM (0.3V scale) to TP-4. Tune T11 and T12 for maximum meter deflection. Connect the VOM to TP-5 and tune T13 and T14 for maximum. Disconnect the VOM.

#### 4. AMPLIFIER TUNING

As T14 is adjusted, some deflection of the RF power output (and DC ammeter) should be apparent. Tune TC9 through TC11 for maximum power output with a minimum DC ammeter indication. It may be necessary to spread the turns of the airwound coils associated with the above mentioned trimmer capacitors to achieve resonance. (Note that no adjustment to the P.A. stage is required).

5. CHANNEL SETTING

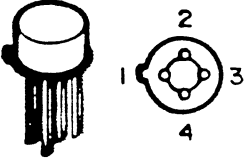



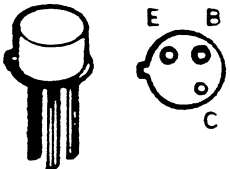
Adjust the trimmer for each transmitter crystal to the desired exact channel frequency, using a suitable frequency counter or a communications test set.


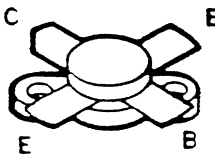
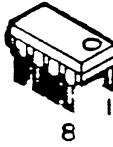
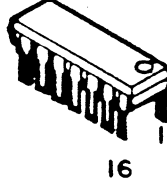
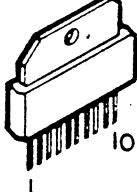
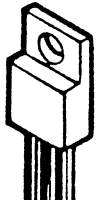
6. DEVIATION ADJUSTMENT

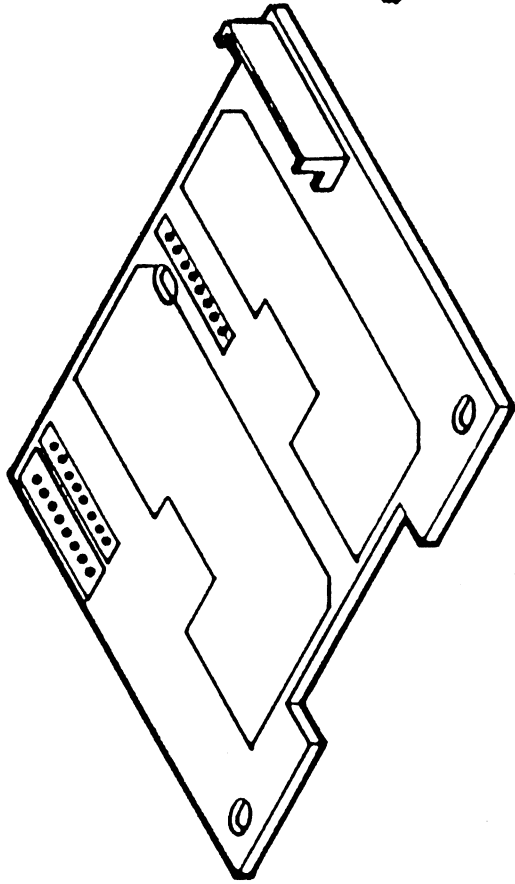
Using an external audio generator connected to the radio's microphone socket, set the deviation control (RV2) to  $\pm 2.5\text{KHz}$  (Maximum), as observed on an oscilloscope so that peak deviation and positive and negative deviations can be checked. Note that when the modulation limiter is overdriven, slight carrier shift will result. This will not occur at normal speech levels. Also note that when crystals for more than one channel are installed, there will be a slight difference in maximum deviation for a given setting of RV2 caused by variations in individual crystal parameters. Always adjust RV2 for 2.5KHz deviation on the channel which shows maximum deviation. It is recommended that crystals from the same manufacturer be used to minimise this deviation variation.

7. POWER SETTING (IF FITTED)

Adjust RV403 to give the required r.f. power output.

SCHEMATIC REF NBR	MAXON PART NBR	MANUFACTURERS NBR	BASE DIAGRAM
Q1	203064-5	3N211	 <p>1. DRAIN 2. GATE 2 3. GATE 1 4. SOURCE</p>
Q2	203027-2	JF1033S	
Q3,4,5,6,14 15,17,18	203005-2	MPS9426(C)	
Q7 Q8,11,13 Q10 Q9,16,22 Q21 Q302,303 Q12,23	203002-9 203014-0 203010-6 203006-3 203054-6 203041-4 203009-6	MPS9634(C) MPS9631(T) MPS9418 (T) MPS9600(H) LSP966 MPS9468A MPS9681(T)	
Q19	203083-2	2N4427	

SCHEMATIC REF NBR	MAXON PART NBR	MANUFACTURERS NBR	BASE DIAGRAM
Q 20	203043-6	SRFH 1900	
Q 301	203087-6	MRF 1946	
IC 4	231008-4	LM386N-3	
IC 1	223008-1	MC 3357P	
IC 2	222008-6	KIA 7222AP	
IC 3	224020-6	78M08	 <p data-bbox="1236 1680 1412 1825"> 1. IN  2. COMMON  3. OUT </p>



MA-3400

To Radio

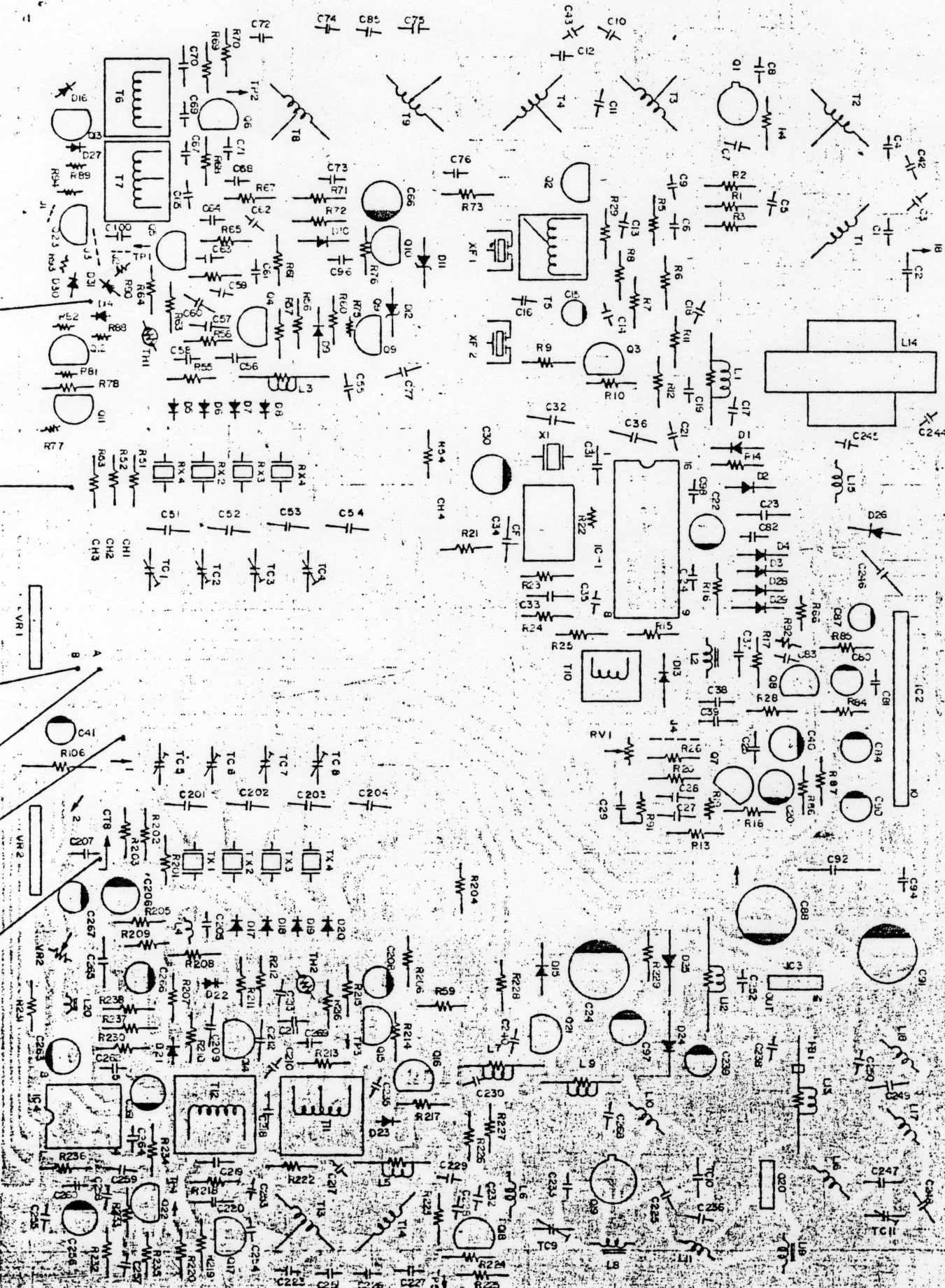
**Tone Option Connections**

Connection Points	Function	Wire Color
CT-1	Ground	Black
CT-2	+ Supply	Red
CT-3	Squelch Switch	Orange
CT-4	Tone Mointor Switch	White
CT-5	P-T-T	Gray or Brown
CT-6	Demodulated Audio From Radio	Green
CT-7	Return Audio to Radio	Blue
CT-8	Encode to Radio	Yellow



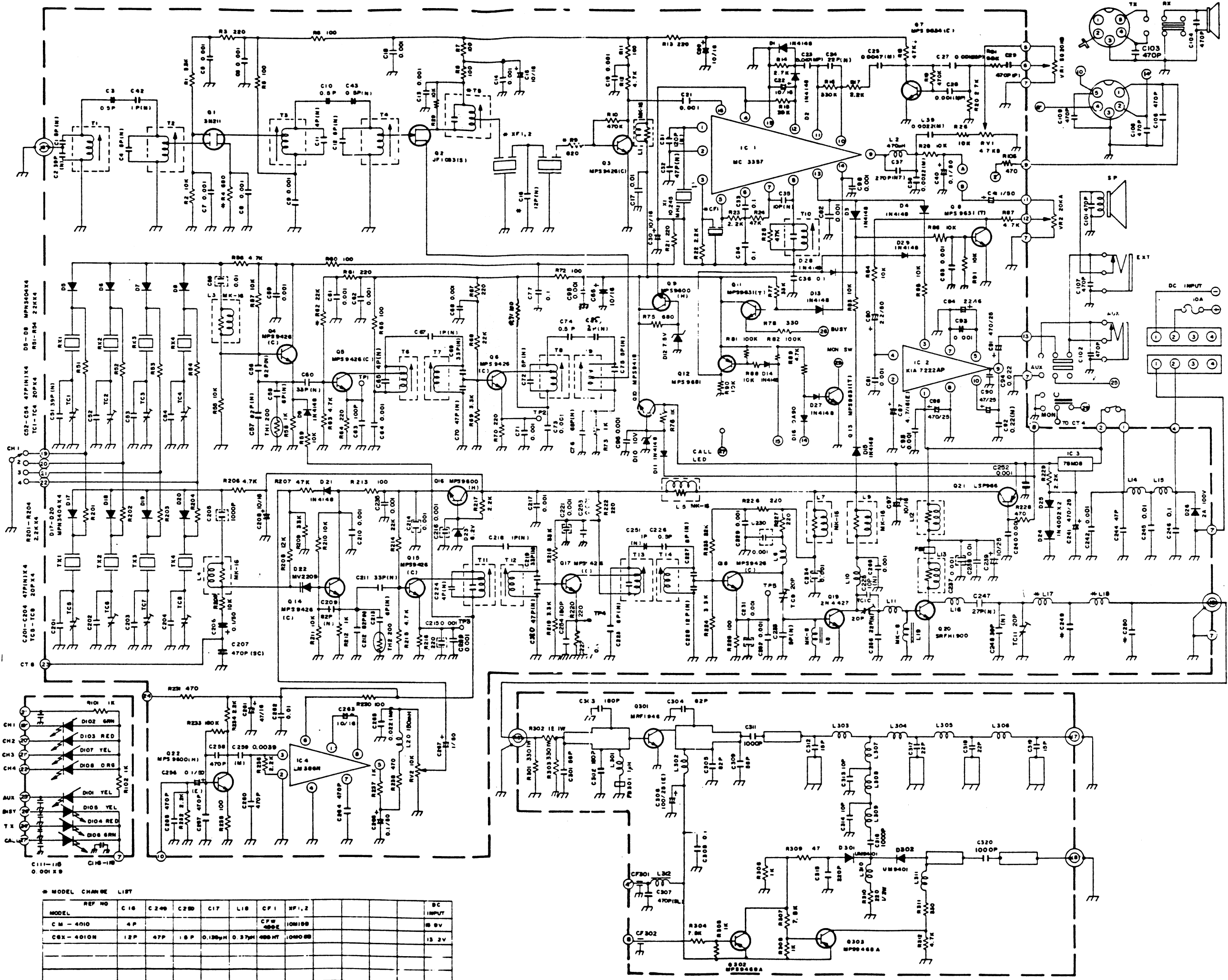
# MAXON CGX-4010-N VHF MOBILE P.C.B. Top View

CT4 (WHITE) TO MONITOR SWITCH  
 CT2 (RED) TO ON/OFF SWITCH  
 CT3 (ORANGE)  
 CT1 (BLACK)  
 CT7 (GREEN)  
 CT6 (GREEN)  
 CT5 (GREEN)  
 CT8 (YELLOW)  
 CT15 (RED)



CT15 (RED)

# Schematic Diagram



**\* MODEL CHANGE LIST**

MODEL	REF NO	C18	C248	C28D	C17	L18	CF1	XF1,2	DC INPUT
C M - 4010		4P					CFW	10M19B	18 DV
CEX - 4010M		12P	47P	18P	0.150µH	0.27µH	400HT	10M100B	13 2V

# maxon

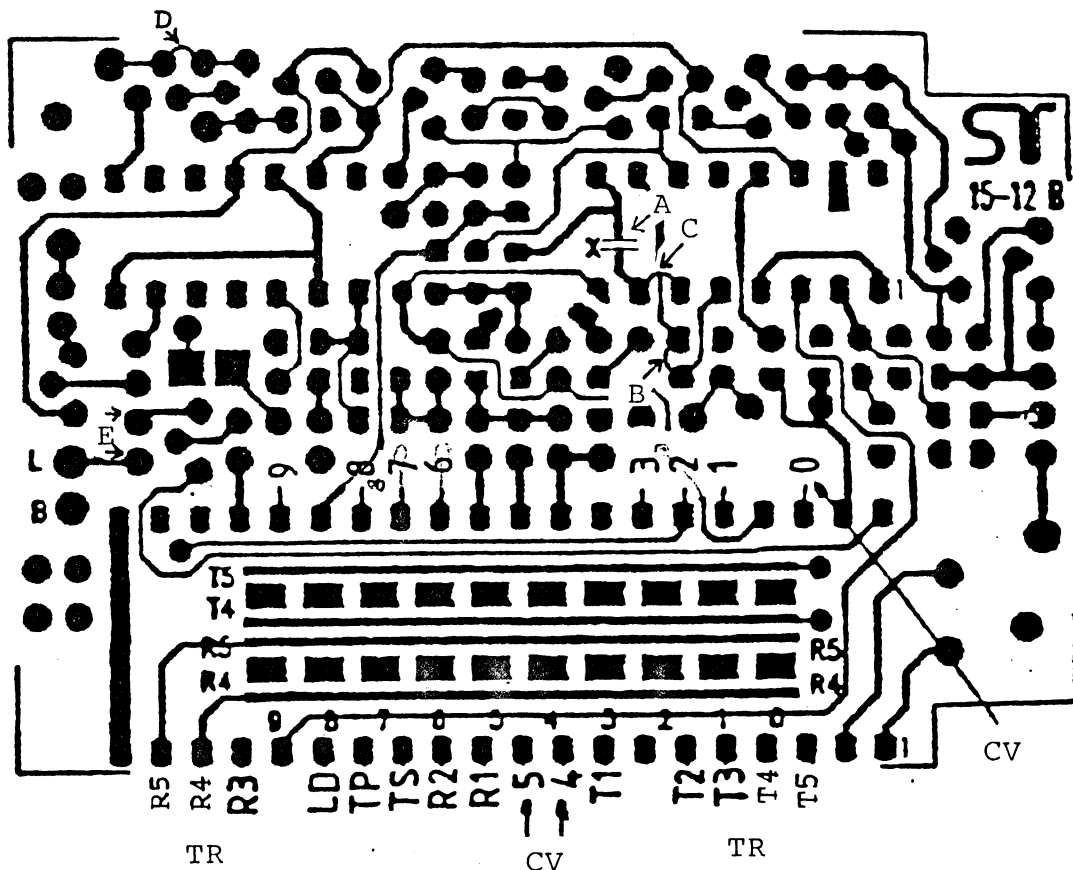
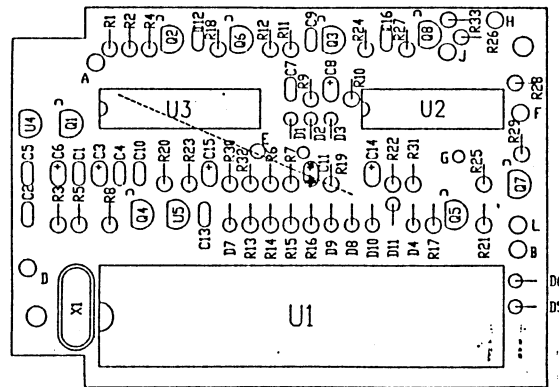
## CGX-4010

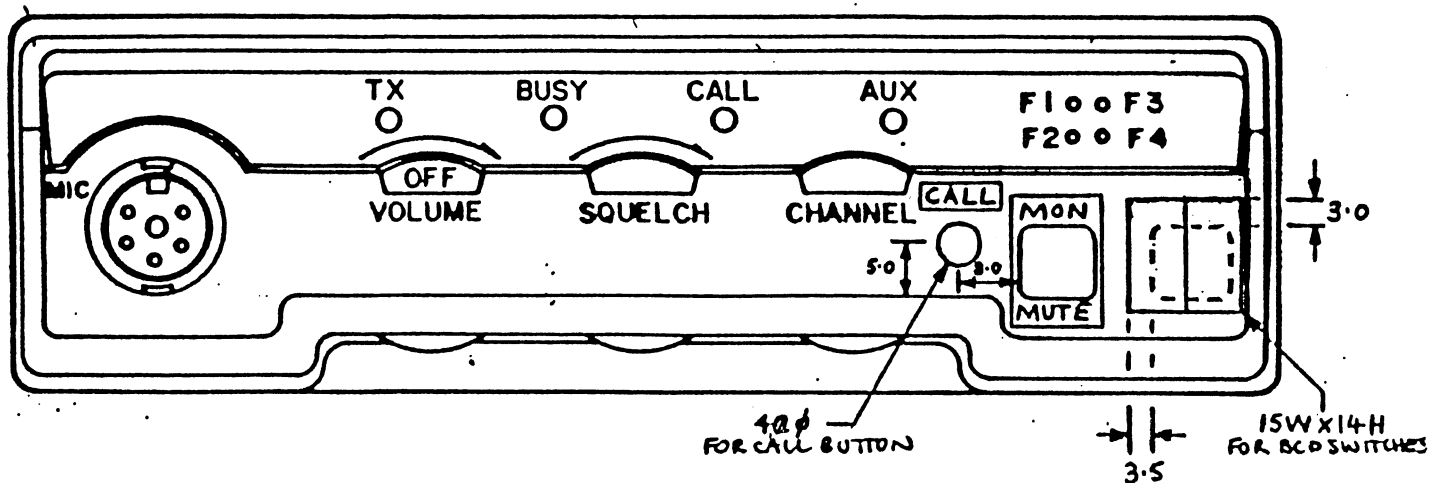
Maxon 4010

Monteringsvejledning for Sel.Call. CA 5015

### 1. Ændringer på CA 5015

- A. Printbane ved "X" mærket skæres over.
- B. Kondensator C 15 kortsluttes.
- C. Kortslut ben 6 og 7 på U3 - MC14572.
- D. R 33 470 K ohm kortsluttes.
- E. R 21 27 ohm ændres til 47 K ohm.
- F. C11 Ændres til 100 nF.

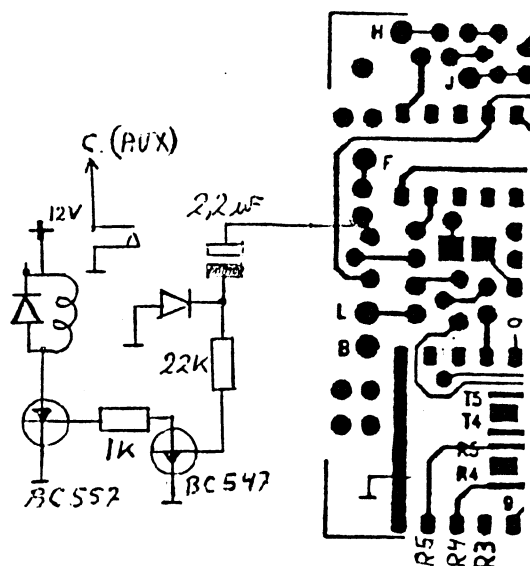




## 2. Ændring i Maxon 4010

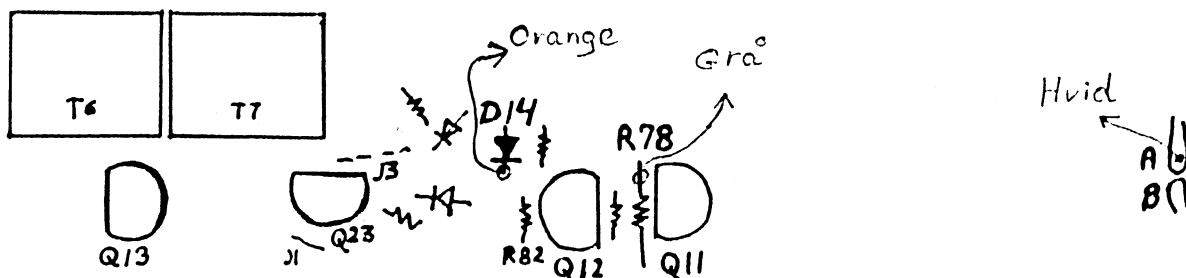
- A. Skru låg og bund af. Skru frontstykke af.
- B. Bor et 4 mm. hul til Call-knap  
8mm. fra AUX - 5 mm fra grå kant.
- C. Fil Monitor-hullet op til 2 stk. BCD -omskiftere.  
Omsk. skal limes.
- D. 8 stk. dioder monteres på BCD-omskifter 1-2-4 og 8  
med katoden til omskifteren. Ledninger forbindes -  
farvekodet.
- E. Monitor - omskifter fjernes. Hvid - grå og sort ledning  
afklippes.
- F. Call- MON/MUTE mærkater påsættes front. Danita - Maxon -  
serienr. skilt på undersiden påsættes. Plastdække sættes  
på skumgummi ved højttaler for at undgå kortslutning af  
CA 5015 til chassis.
- B. Ledninger til CALL: 1. Sort til stel på LED print.  
2. Grøn fra CA 5015.

EXT.alarm kan udtages på AUX -  
bøsningen. ( Dette ekstra til-  
behør bliver ikke tilbudt i  
annonceringen ).  
Hvid ledning på AUX loddes op  
på brun ledning på EXT.SP.  
Ledning mellem AUX og EXT.SP.  
fjernes.  
Ledning fra C. på ekstra tran-  
sistor til AUX hvor hvid led-  
ning sad, monteres.



### 3. Montering af CA 5015

- A. Printet monteres med printbaner opad ( på printet med dobbelttape ), og U1 - TC8712 mod center af radio. Derved er mærkerne L og B på CA 5015 mod "tapeprintets" ben 1 og 2.
- B. Sort : Til stel på hovedprint.  
Brun : Til ben 6 på IC 2 ( KIA 7222 ).  
Rød : Til ON/OFF hvor der er to røde ledn. i forvejen.  
Orange: Til katode på D 14.  
Gul : Til ben 4 på mic. jack. ( gul ).  
Grøn : Til Call. omsk. på front.  
Blå : Med 1,5 K ohm i serie til ben 3 på IC 4 ( LM 386 ).  
Lilla : Til center på "MON/MUTE" omskifter, hvor gul ledning er mont.  
Grå : Loddet på R 78, på punktet mod center af radio.  
Hvid : Til punkt A på hovedprint (AB).  
Rosa : LED print C 114/~~AB~~ode af Call. LED.



### 4. Selektiv kodning af CA 5015

- A. TS ( tonesystem ) forbindes til CV ( ciffervalg ) 0 = CCIR.  
3 = ZVEI 1. 4 = ZVEI 2.
- B. Kodningen er fra fabrikkens side sat til 10000.  
Er nogen af RX eller TX koderne de samme, behøves der ingen kodning. ( CA 5015 indsætter selv R - kode ).
- C. Ledninger fra omskifter forbindes til CV 1,2,4 og 8.  
De to C-punkter på BCD omskifter forbindes til det nr. i TR ( tonerække ), der ønskes variabel.
- D. TR ( R 1-5 og T 1-5 ) forbindes til de CV som kunden ønsker.  
EKS.: RX-kode 140R0 - skal kun R2 forbindes til CV 4.  
EKS.: TX-kode 543VV  
T1 til CV 5 - T2 til CV 4  
T3 til CV 3 - C på BCD omsk. ( front ) til T4 og T5.





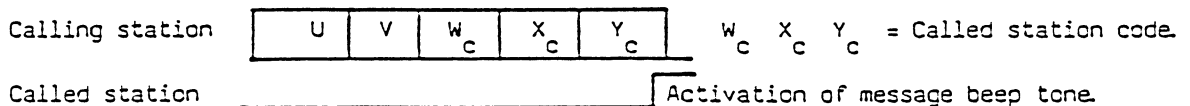
5 TONE AND DIGITAL SELECTIVE CALLS :

1 - EUROPEAN STANDARDS

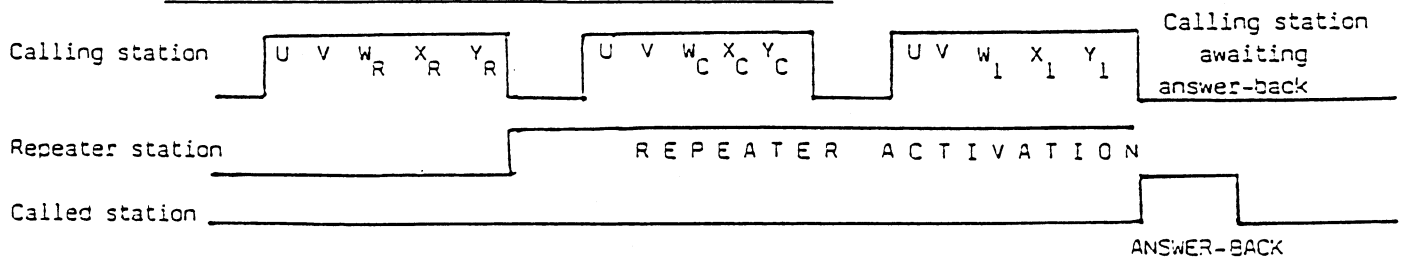
- The various CCIR or ZV EI selective call systems are now widely used in most existing radio networks. With each code digit is associated an audio frequency of a given duration.  
 . With the SUPERCALL access to both standards is obtained through the relevant programme (500 ms for the CCIR and 350 ms for ZVEI - 200 ms optional).
- In several countries, the first 2 code digits correspond to the manufacturer's code.
- The next 3 digits are allocated by the installer for each particular radio network. Each transceiver in a given network will be identified by its own identity code (ex. 1 4 2 1 2).
- In radio networks using a repeater, it is advisable to activate the repeater by a 5-tone code in order to prevent unauthorized users from accessing the repeater. To call mobile or portable stations via a repeater, the repeater 5-tone call will be sent first, followed, after a short-time interval by the identity code of the called station.
- For sophisticated system transceivers, it may be useful to know the identity of the calling station (incoming call identification). In this configuration, the code generated will consist of the 5-tone identity code of the called station followed by the 5-tone identity code of the calling station. The second 5-tone sequence will be displayed on the called station digital read-out.
- It may be interesting or important to know if the call transmitted has been well received. In that case, the called station will transpond "or answer-back" by sending its own identity code back to the calling station. This answer-back can be in the form of a 5-tone code, or a 16 bit code.

2 - DIFFERENT RADIO NETWORK CONFIGURATIONS

2.1 Single radio network (no repeater, no call identification)



2.2 Radio network with repeater and call identification



U V W<sub>R</sub> X<sub>R</sub> Y<sub>R</sub> = repeater code = 5 tone code for repeater activation.

U V W<sub>C</sub> X<sub>C</sub> Y<sub>C</sub> = called station code.

U V W<sub>I</sub> X<sub>I</sub> Y<sub>I</sub> = identity code of calling station.

A to H PROGRAMMING TERMINALS

Programming of these terminals is obtained by soldering, where necessary, a link or a diode.

- TERMINAL A : selecting the type of network  
 - with link : called station code before identity code.  
 - no link : identity code before called station code.

- TERMINAL B : answer-back selection  
 - with link : digital answer-back.  
 - no link : 5-tone answer-back.

- TERMINAL C : identity code :  
 - with link : no identity code.(in this case do not link terminal "A")  
 - no link : with identity code.

- TERMINAL D : group call :  
 - with link : no group call.  
 - no link : with group call.

- TERMINAL E : selcall standard :  
 - with link : C C I R.  
 - no link : Z V E I. (see terminal H)

	0	1	2	3	4	5	6	7	8	9	R
CCIR	1981	1124	1197	1275	1358	1446	1540	1640	1747	1860	2110
ZVEI 1 16F3	2400	1060	1160	1270	1400	1530	1670	1830	2000	2200	2600
ZVEI 2 11F3	2400	1060	1160	1270	1400	1530	1670	1830	2000	2200	970

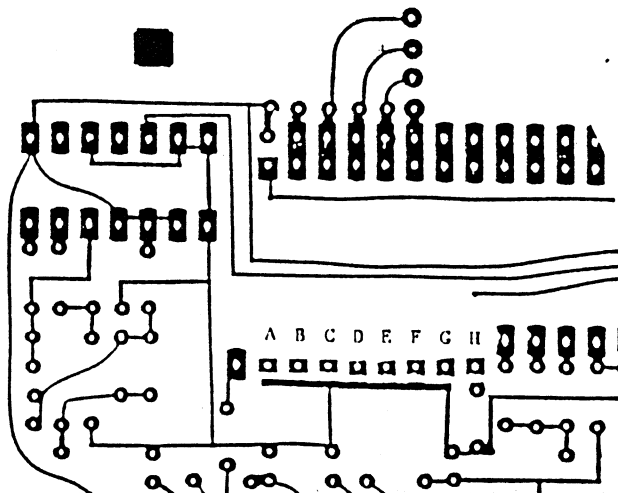
TERMINALS F and G : tone duration selection (through a combination of links over these two terminals)

F	NO LINK	WITH LINK		NO LINK	WITH LINK
G	NO LINK	NO LINK		WITH LINK	WITH LINK
DURATION	100 ms	70 ms		40 ms	

- TERMINAL H : ZVEI PROGRAMMING (do not solder link E in that case)  
 - with link : ZVEI 2 (11 F 3)  
 - no link : ZVEI 1 (16 F 3)

NOTE : ANSWER-BACK

The answer-back is now always generated except for group call.





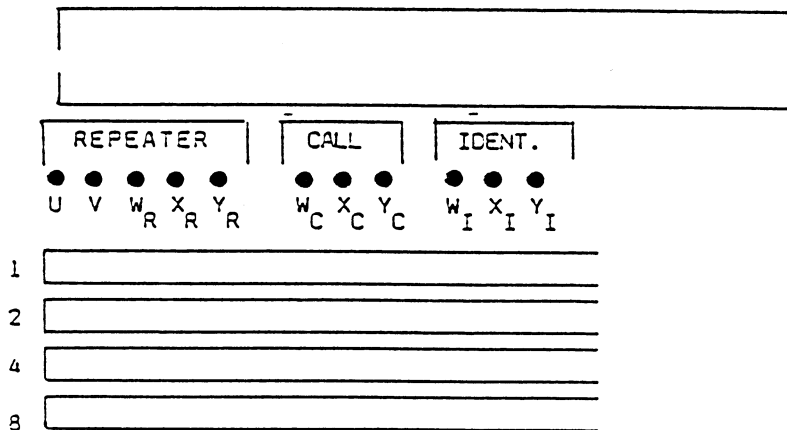
CODE PROGRAMMING (make sure the diodes are wired in the right direction).

- The 3 codes to be programmed are : the repeater code (if necessary), the code of the called mobile and the identity code (calling mobile).  
The first 2 tones of each code are normally identical (they generally correspond to the manufacturer's code) : these first two tones will be programmed once on the repeater code.  
The programming of each tone is made in the form of an hexadecimal binary code in which every logic state 1 is represented by a diode wired from lines 1, 2, 4 and 8.

- CORRESPONDENCE CHART

TONE NUMBER		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
CODE	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
BINARY	2	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
HEXADEC.	4	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
	8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
REPEATER CODE		5 TONES											570	650	740	850	NO CODE
													1 TONE				

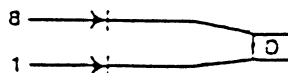
- TERMINAL DESCRIPTION



- GROUPE CALL TONE PROGRAMMING

It is possible to programme the group call tone between 0 and 9. If the terminal 0 is not linked, the group call tone is automatically "0". To choose another tone, diodes must be wired between terminal 0 and the lines 1, 2, 4, 8.

Ex. : Network MATRA with group call on tone "9"



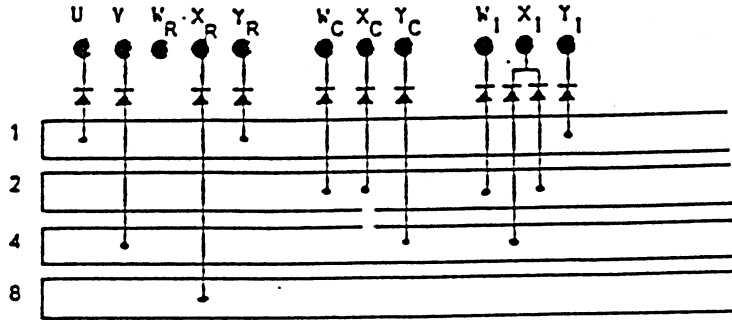
- REPEATER CODE PROGRAMMING :

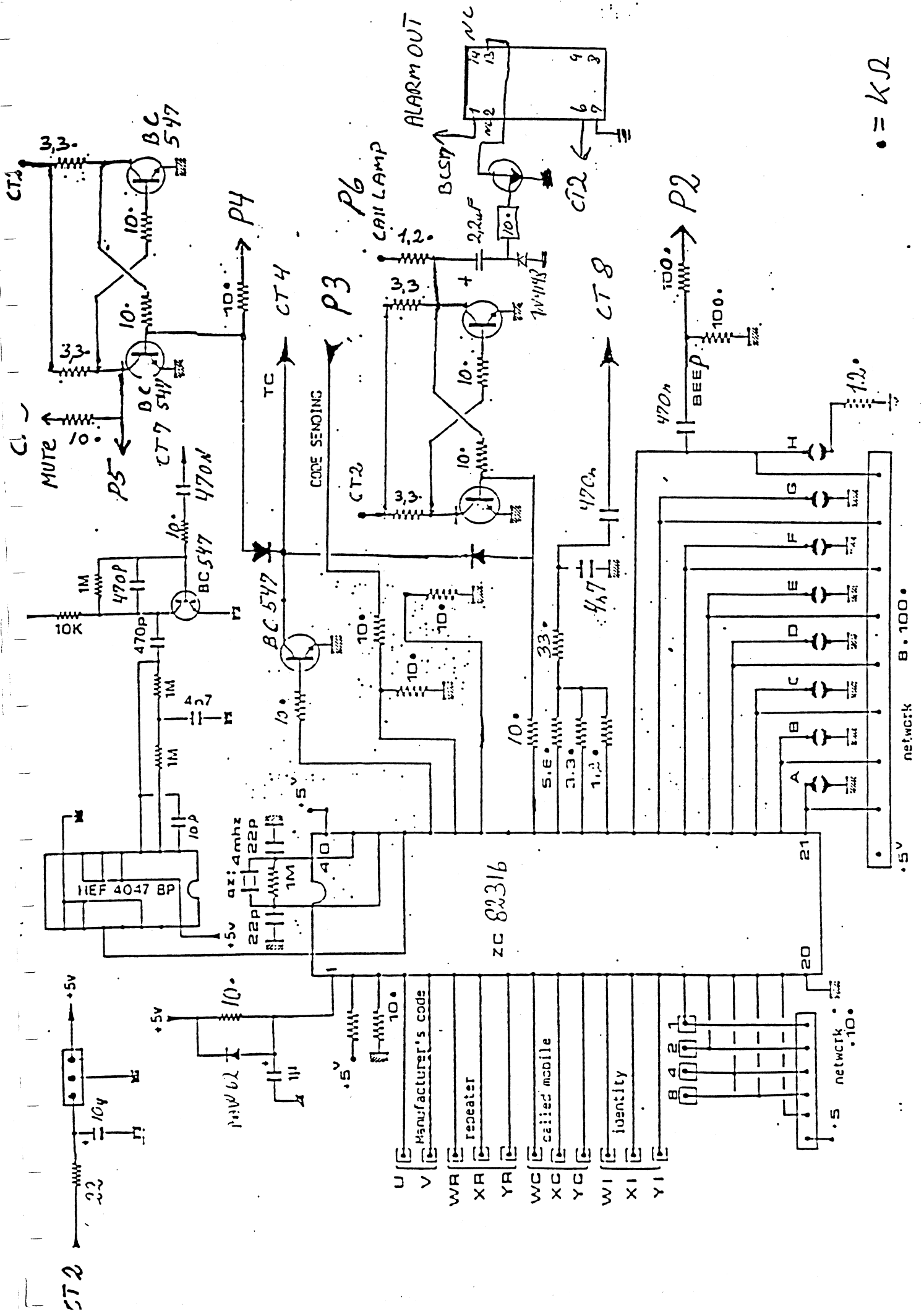
The type of the repeater code depends on the programming of Yr :

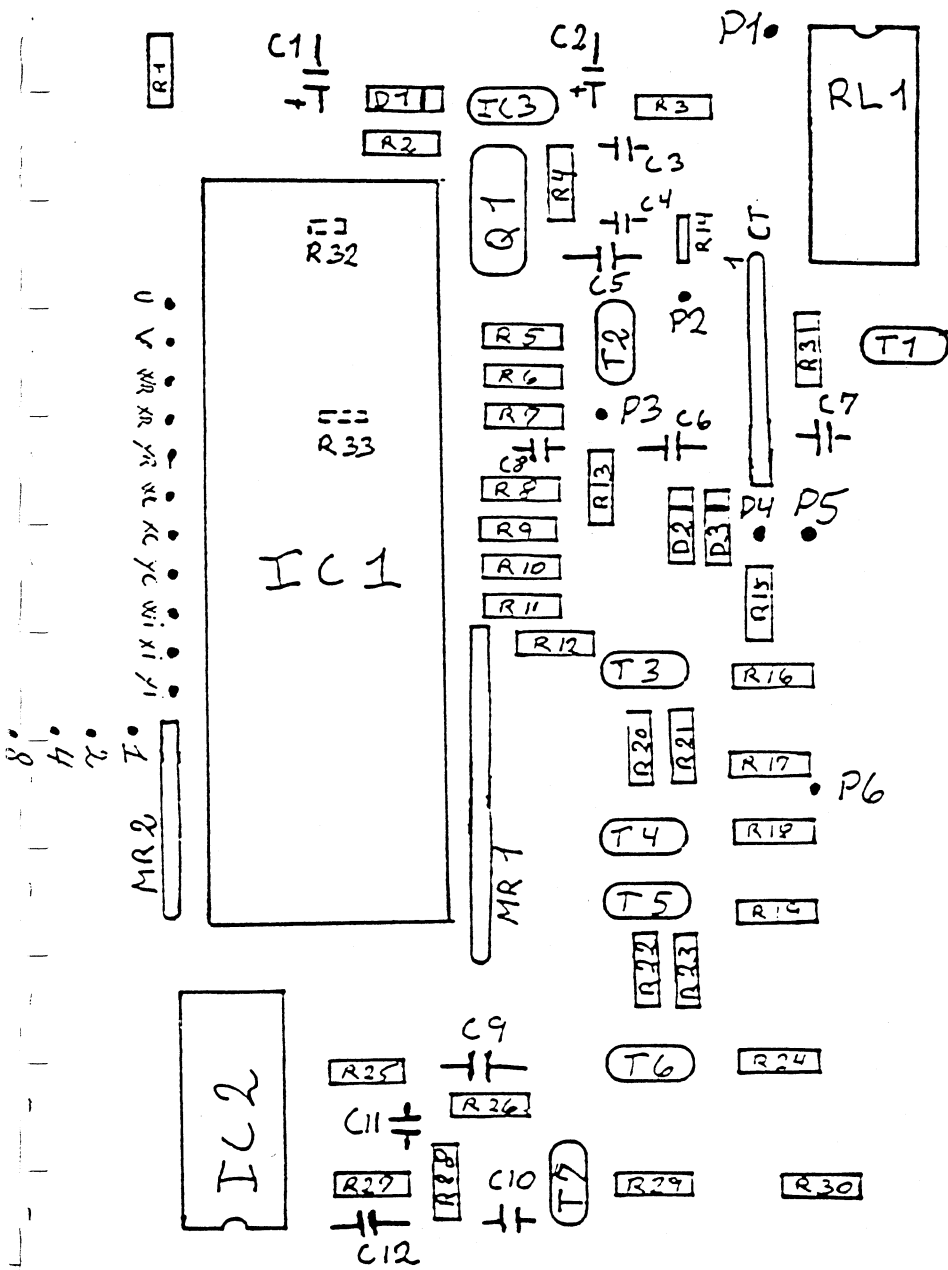
- 0 to 9 programming : 5 tone repeater code (see example on next page)
- 8 to E programming : 1 tone repeater code (see correspondence chart above)
- F programming : no repeater code (see correspondence chart above).

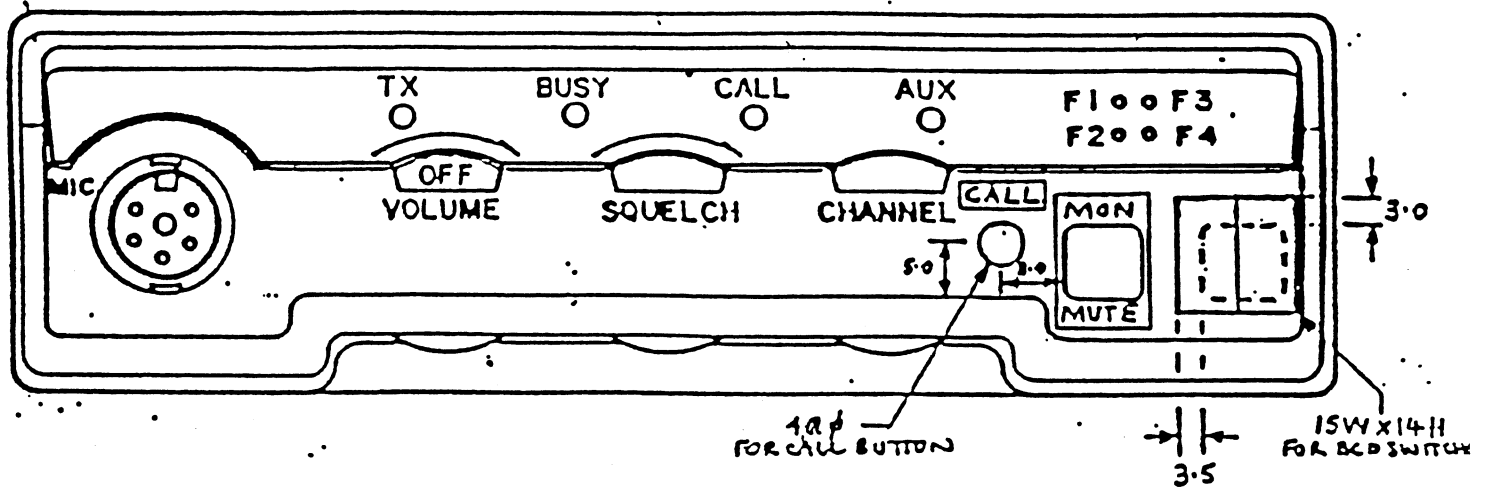
PROGRAMMING EXAMPLES (with diodes 1 N 4148 → )

- Repeater code : U V W<sub>R</sub> X<sub>R</sub> Y<sub>R</sub> : 1 4 8 0 1
- Called mobile code : U V W<sub>C</sub> X<sub>C</sub> Y<sub>C</sub> : 1 4 2 2 4
- Identity code : U V W<sub>I</sub> X<sub>I</sub> Y<sub>I</sub> : 1 4 2 6 1









## 2. Ændring i Maxon 4010

- A. Skru låg og bund af. Skru frontstykke af.
- B. Bor et 4 mm. hul til Call-knap  
8mm. fra AUX - 5 mm fra grå kant.
- C. Fil Monitor-hullet op til 2 stk. BCD -omskiftere.  
Omsk. skal limes.
- D. 8 stk. dioder monteres på BCD-omskifter 1-2-4 og 8  
med katoden til omskifteren. Ledninger forbindes -  
farvekodet.
- E. Monitor - omskifter fjernes. Hvid - grå og sort ledning  
afklippes.
- F Supercall monteres hvor blindprintet sidder  
på toppen af spolehusene T3-T4-T8-T9 påklæbes  
isolerendetape Multistikket sættes på supercall med  
sortledning mod sendertrin.
- G. Aux omskifter: grønledning forlænges til P5 på supercall  
sort-brun fjernes, pal i omskifter tages ud.  
12V fra on/off til midterben på omskifter  
P4 fra supercall til bagerste ben på omskifter.
- H. 10V fra R101-R102 til callsw  
P3 fra supercall til callsw
- I. P6 fra supercall til anode på calllampe.
- J. P2 fra supercall til ben6 IC2 (kia 7222)
- K. alarmledning monteres yderst i DC stik -P1 på supercall

## Komponent liste

22ohm R3

1,2Kohm R11,R12,R17

3,3Kohm R10,R16,R18,R19,R24,R29

5,6Kohm R9

10Kohm R1,R2,R5,R6,R7,R8,R15,R20,R21

R22,R23,R25,R30,R32,R33

33Kohm R13

100Kohm R14

1Mohm R4,R26,R27,R28

Netværk 10Kohm MR2

Netværk 100Kohm MR1

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10P C12

22P C3,C4

470P C9,C10

4N7 C8,C11

470N C5,C6,C7

1uF C1

10uF C2

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BC 517 T1

BC 547 T2,T3,T4,T5,T6,T7

78105 Ic 3

4047 Ic 2

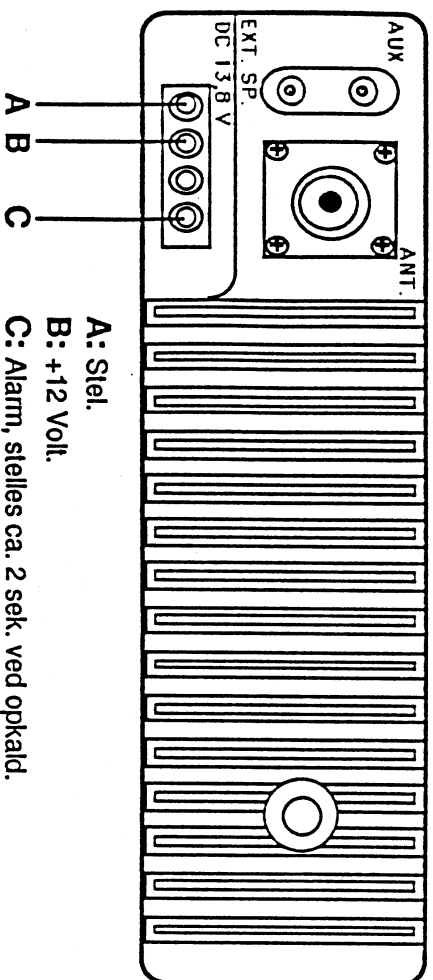
ZC 82316 IC 1

Q1 Xtal 4MHZ

BaW 62 D1

OA95 D2,D3

## Alarm-udtag på SUPERCALL:

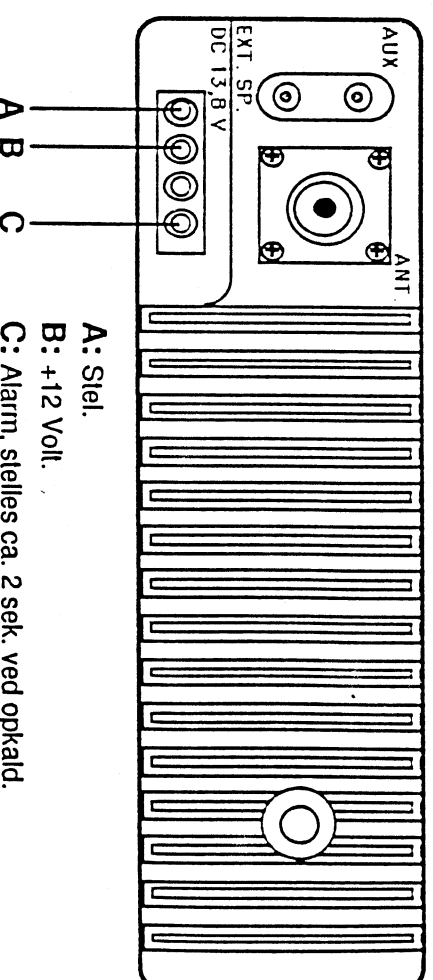


## Specielt for apparater forsynet med SUPERCALL:

Ved opkald: vælg den ønskede modtager på omskifteren: G og kald med call-knappen:  
E. Når opkaldet besvares indledes samtalen som anført ovenfor (tryk og tal/slip og ly!).

Før modtagelse af opkald: knappen: F skal aktiveres til lampen: K lyser. Apparatet er nu klar til at modtage et opkald. Når korrekt opkald modtages, høres biplone fra den indbyggede højttaler og lampen: J lyser konstant til opkaldet besvares, (lampen: J slukker ved tryk på mikrofonens sendelas). For at gøre stationen klar til at modtage nyt opkald, trykkes knappen: F ind til lampen: K lyser. Apparatet er nu i "stand-by" og klar til modtagelse af nyt opkald.

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Import & Engros

Danittas Radio A/S Østbanegade 55, 2100 Kbh. Ø. 01 428020



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