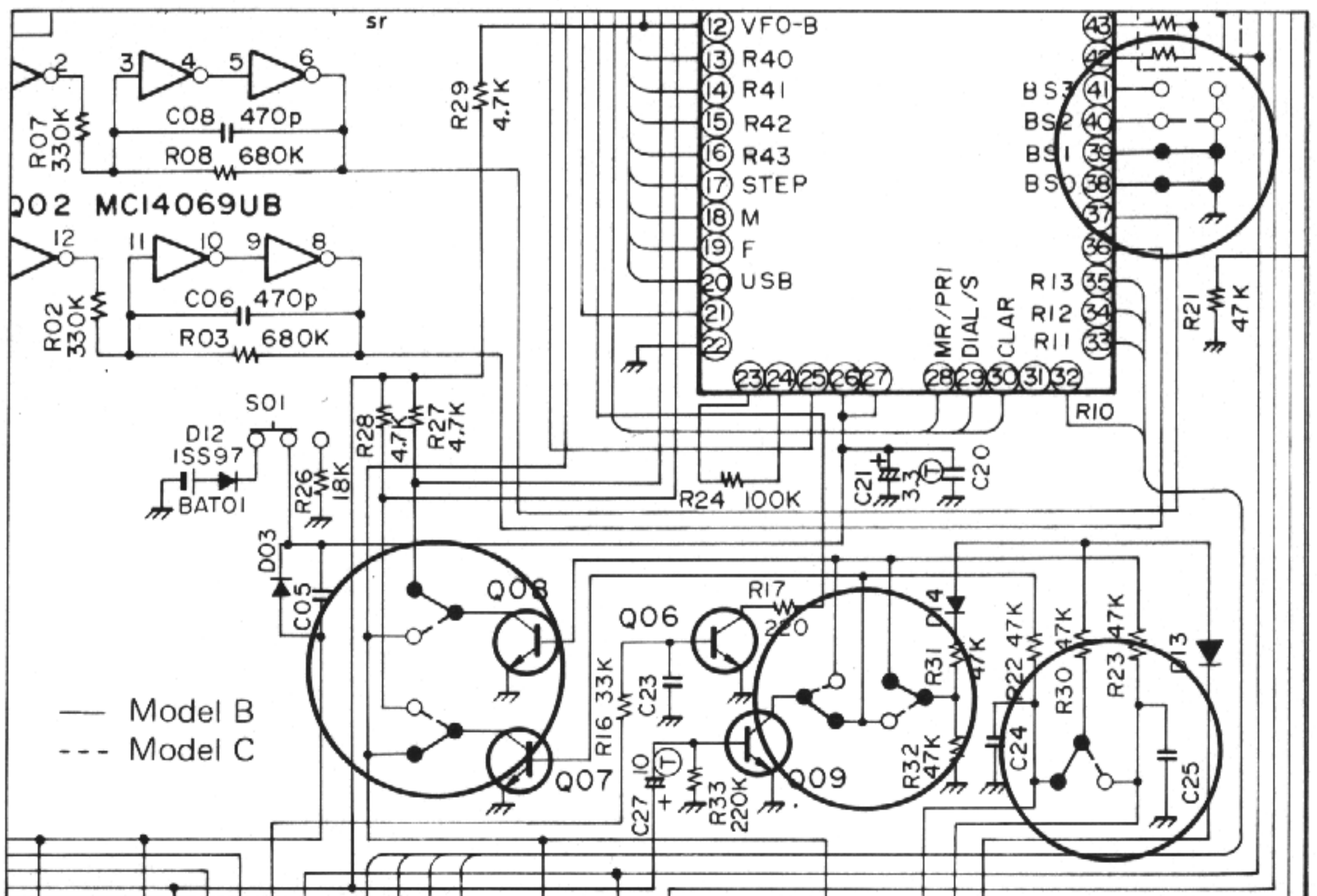
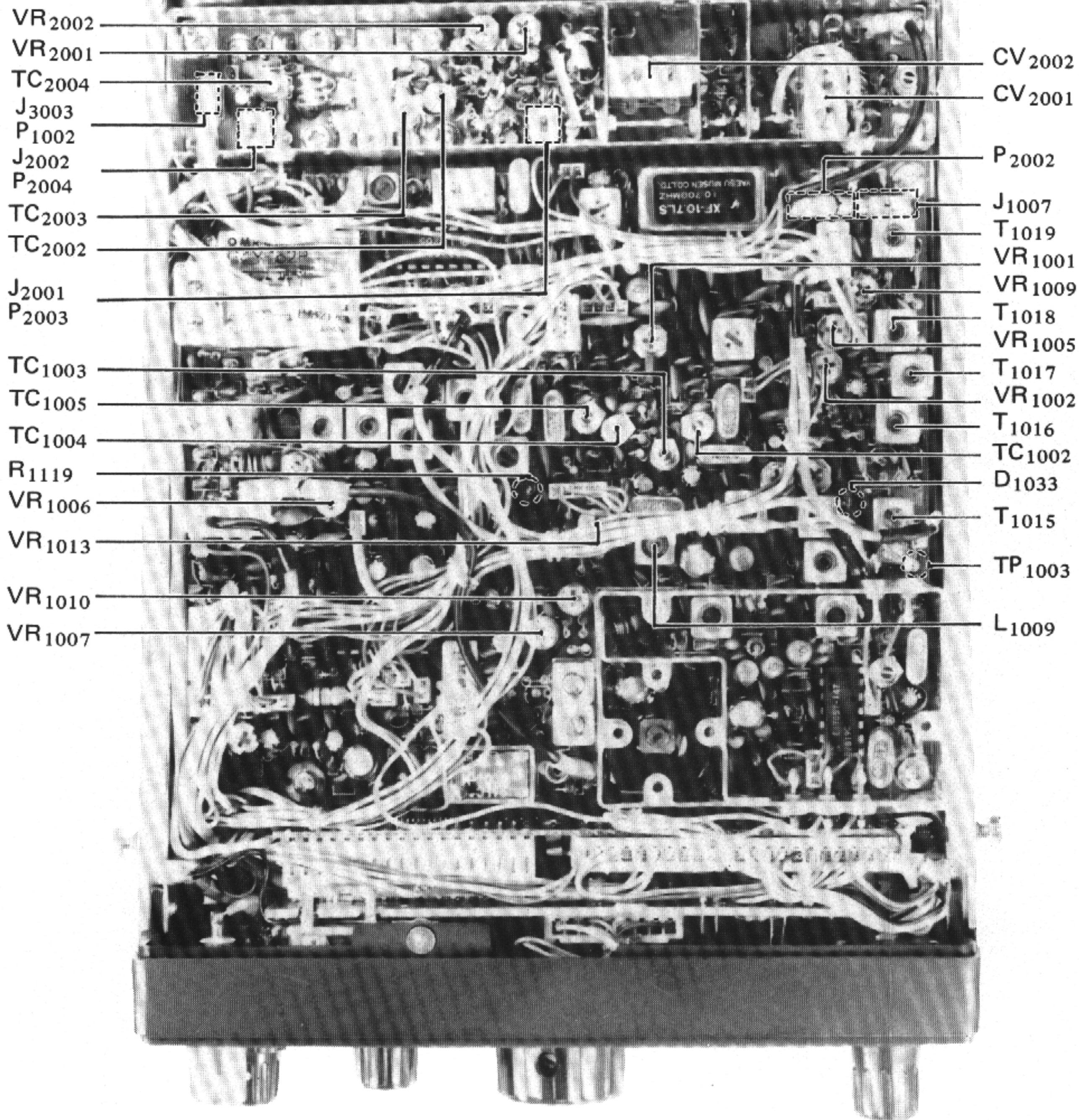
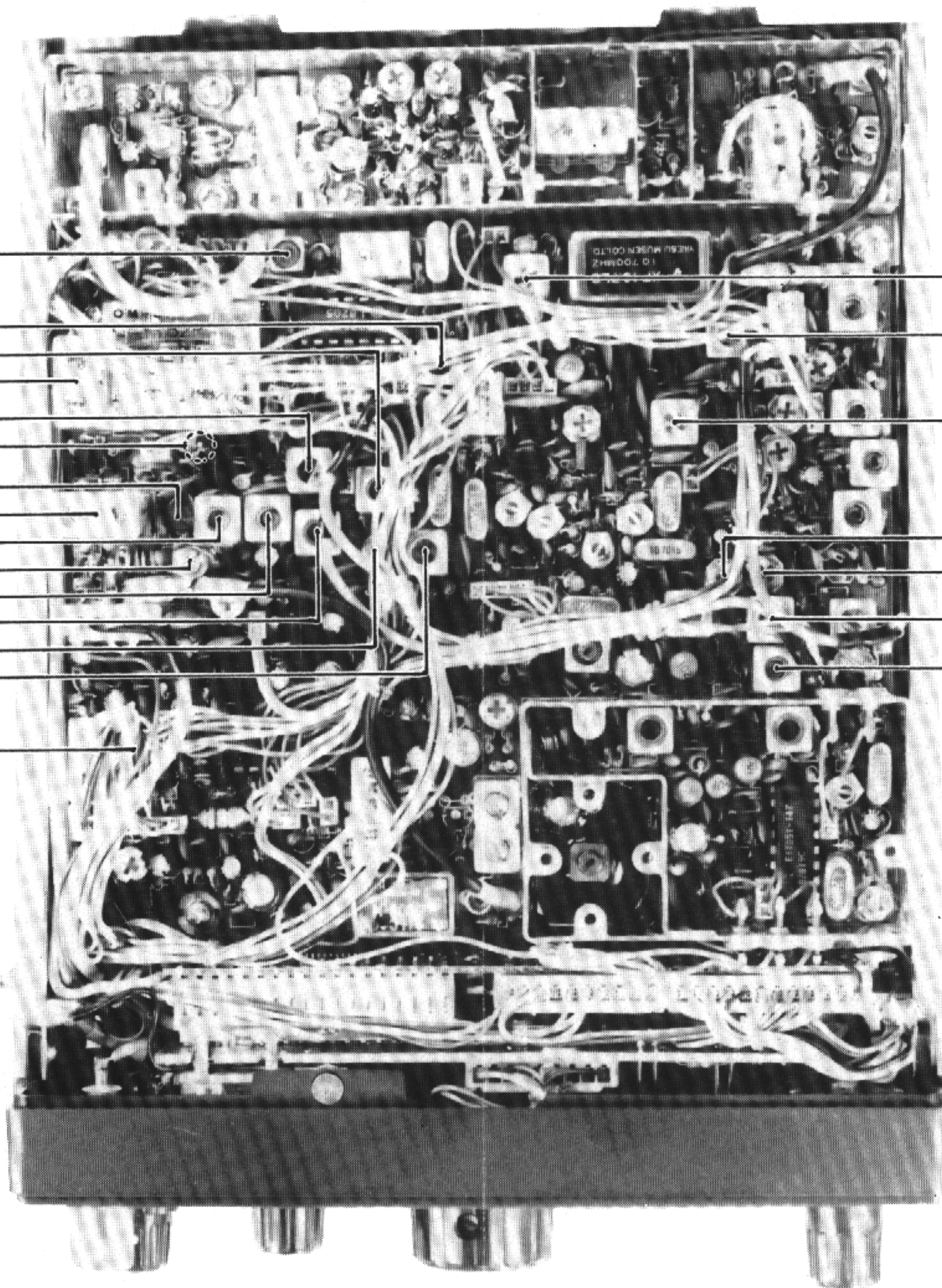


### METER (BATTERY CHECK), SQUELCH PRESET ALIGNMENT POINTS





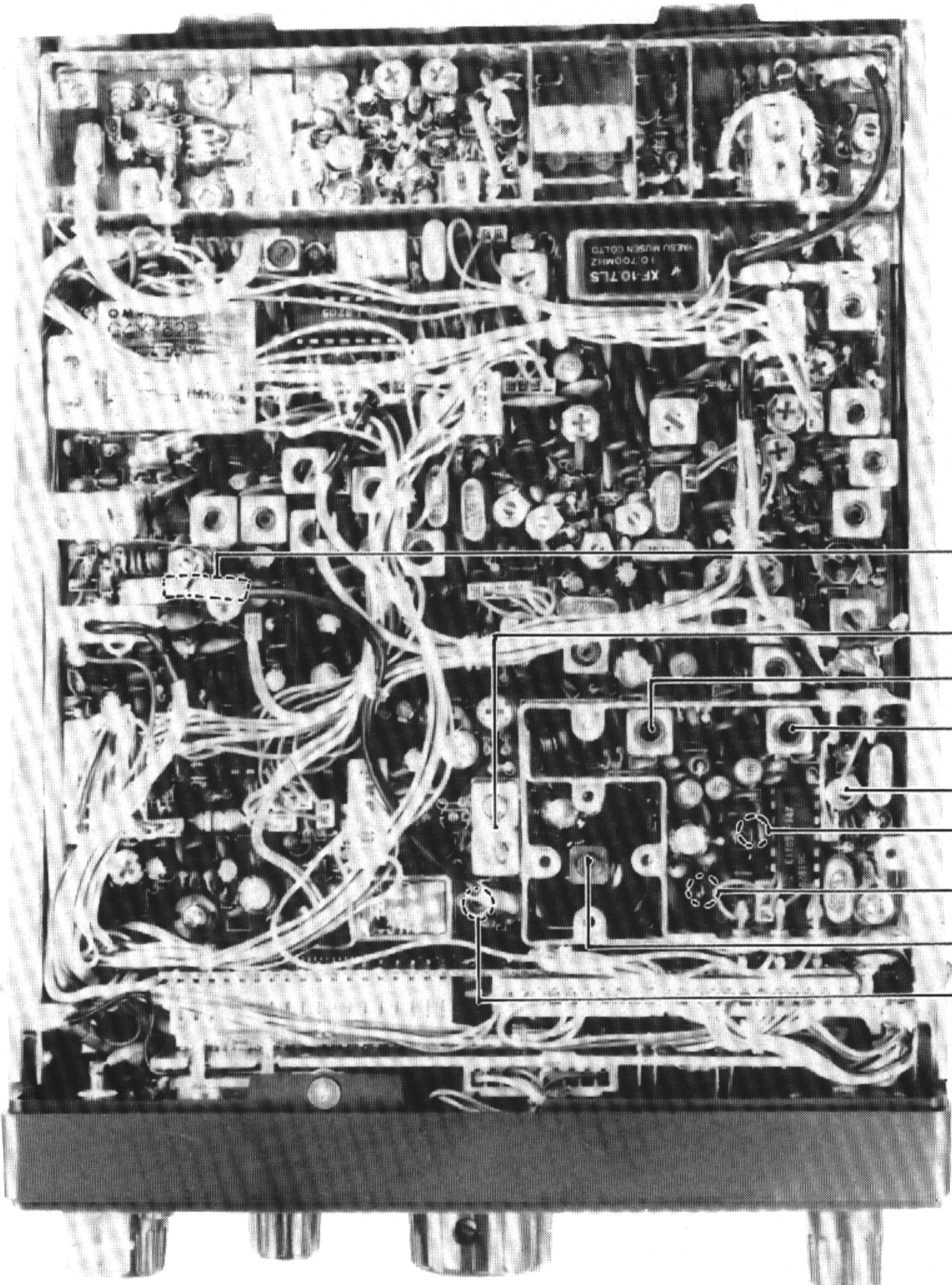
**TRANSMITTER SECTION ALIGNMENT POINTS**



T<sub>1008</sub>  
T<sub>1006</sub>  
T<sub>1004</sub>  
CV<sub>1001</sub>  
T<sub>1007</sub>  
TP<sub>1002</sub>  
Q<sub>1002</sub>  
CV<sub>1002</sub>  
T<sub>1001</sub>  
TC<sub>1001</sub>  
T<sub>1002</sub>  
T<sub>1003</sub>  
Q<sub>1003</sub>  
T<sub>1005</sub>  
VR<sub>1011</sub>

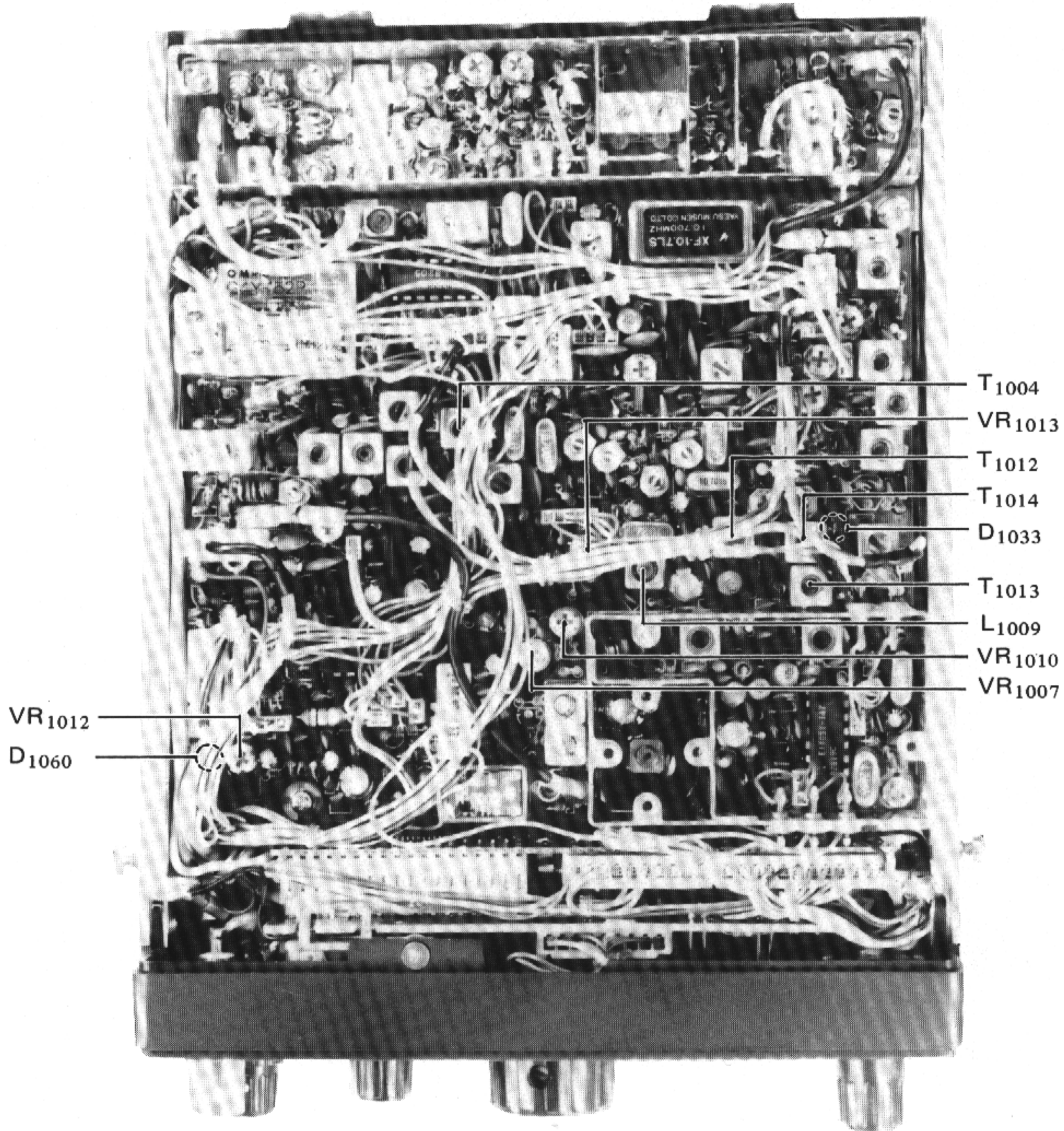
T<sub>1009</sub>  
T<sub>1010</sub>  
T<sub>1011</sub>  
VR<sub>1003</sub>  
VR<sub>1004</sub>  
T<sub>1014</sub>  
T<sub>1013</sub>

RECEIVER SECTION ALIGNMENT POINTS



- P<sub>1001</sub>
- CV<sub>1003</sub>
- T<sub>1020</sub>
- T<sub>1021</sub>
- TC<sub>1006</sub>
- R<sub>1163</sub>
- R<sub>1173</sub>
- L<sub>1011</sub>
- J<sub>1008</sub>

**PLL SECTION ALIGNMENT POINTS**



VR<sub>1012</sub>

D<sub>1060</sub>

T<sub>1004</sub>

VR<sub>1013</sub>

T<sub>1012</sub>

T<sub>1014</sub>

D<sub>1033</sub>

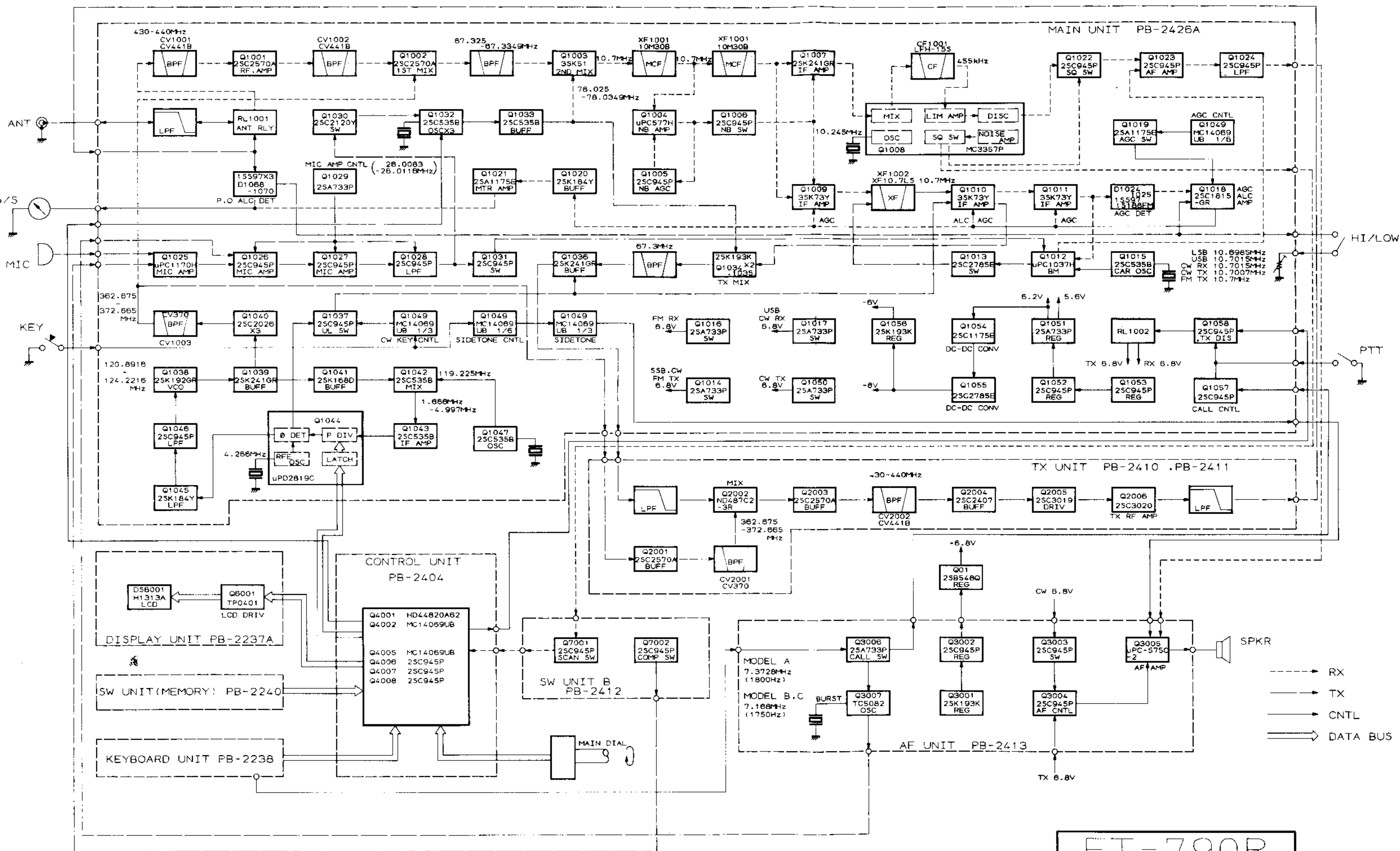
T<sub>1013</sub>

L<sub>1009</sub>

VR<sub>1010</sub>

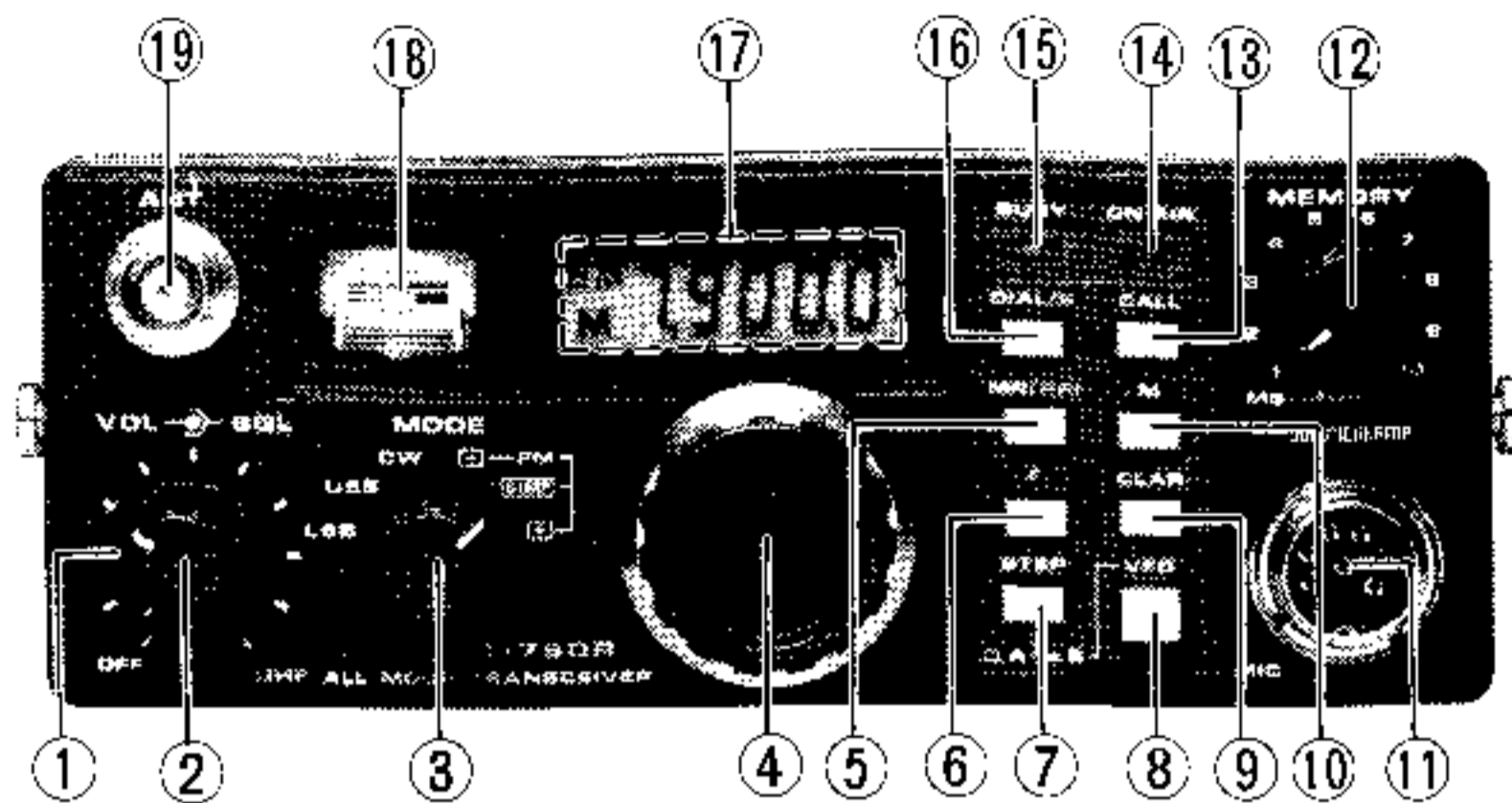
VR<sub>1007</sub>

**78 MHz LOCAL SECTION ALIGNMENT POINTS**



**FT-790R**  
**BLOCK DIAGRAM**

# FRONT PANEL CONTROLS AND SWITCHES



MODEL B



MODEL C

## (1) SQL

The squelch control silences the receiver in the FM mode when no stations are being received on the channel in use. The SQL control should only be advanced to the threshold point of background noise silencing; further advancing this control will lead to reduced sensitivity to weak signals.

## (2) VOL

This is the audio gain control for the receiver, as well as the main ON/OFF switch for the transceiver.

## (3) MODE

This selector determines the desired operating mode: LSB, USB, CW or FM. The **[-]**, **[SIMP]** and **[+]** positions select FM simplex or transmitter offsets for FM repeater operation. The **[+]** position is labelled **[REV]** in Model B, indicating that the transmit and receive frequencies are reversed. The **[-]** position is labelled **[REV]** in Model C for the same reason.

## (4) MAIN DIAL

The main tuning dial is used for selection of operating frequencies using the two main VFOs or the clarifier. In the LSB, USB, and CW modes, synthesizer steps of 100 Hz or 1 kHz are programmed, while on FM the channel steps are 25 kHz or 100 kHz each. In the clarifier mode, the synthesizer moves in 100 Hz steps.

## (5) MR/PRI

This switch selects either the memory recall mode or priority channel operation. If only the MR/PRI switch is pressed, the memory channel selected by the MEMORY rotary switch will be activated. If the yellow F button is first pressed and then the MR/PRI button, priority channel operation will be selected.

## (6) F

The yellow "F" (Function) button activates either the priority channel mode or the memory split mode. The F button itself does not select a mode, but it programs the microprocessor to select the mode labeled in yellow letters on either of the two switches immediately above the F button: DIAL/S or MR/PRI.

## (7) STEP

This switch selects the desired synthesizer steps. In the LSB, USB, or CW mode, the preset mode\* is 100 Hz per step. Press the STEP button to switch to 1 kHz steps. A second press of this switch returns you to 100 Hz steps. In the FM mode, the preset is for 25 kHz steps. Pressing the STEP switch selects 100 kHz steps, while a second press returns you to 25 kHz steps.

## (8) VFO Switch

The VFO button selects one of the two internal VFOs on the FT-790R. Press the VFO switch to select VFO-B, and dial up the new frequency. A second press of the button releases the switch, returning you to VFO-A.

\* When the lithium memory backup is on, switch-on (preset) conditions will be the same as when the transceiver was last switched off.

### (9) CLAR

This switch activates the receiver offset tuning feature (Clarifier). The clarifier allows  $\pm 9.9$  kHz of offset from the transmit frequency, tuned in 100 Hz steps (all modes).

### (10) M

The M (Memory) button is used to store a frequency in memory.

### (11) MIC

This seven pin jack accepts microphone audio input, the scanning control lines, and the PTT (Push to Talk) control line. Microphone impedance is 500 ohms.

### (12) MEMORY

The memory channel selector is used to choose any of the 10 memory channels. In the MS (Memory Scan) position, scanning of the memories may be performed.

### (13) CALL

When this button is pressed (FM mode only), an 1800 Hz tone will be superimposed on the microphone line, and the PTT switch line will be grounded, activating the transmitter. This allows manual-length access of repeaters requiring a burst tone.

### (14) ON AIR

This indicator lights up while transmitting.

### (15) BUSY

This indicator lights up when the main squelch is opened up by an incoming signal.

### (16) DIAL/S

When the DIAL/S button alone is pushed, tuning is accomplished by the main dial on either VFO-A or VFO-B. If the F button is pushed and then the DIAL/S button, the memory split mode will be selected; for receiving on the memory while transmitting on the VFO.

### (17) DIGITAL DISPLAY

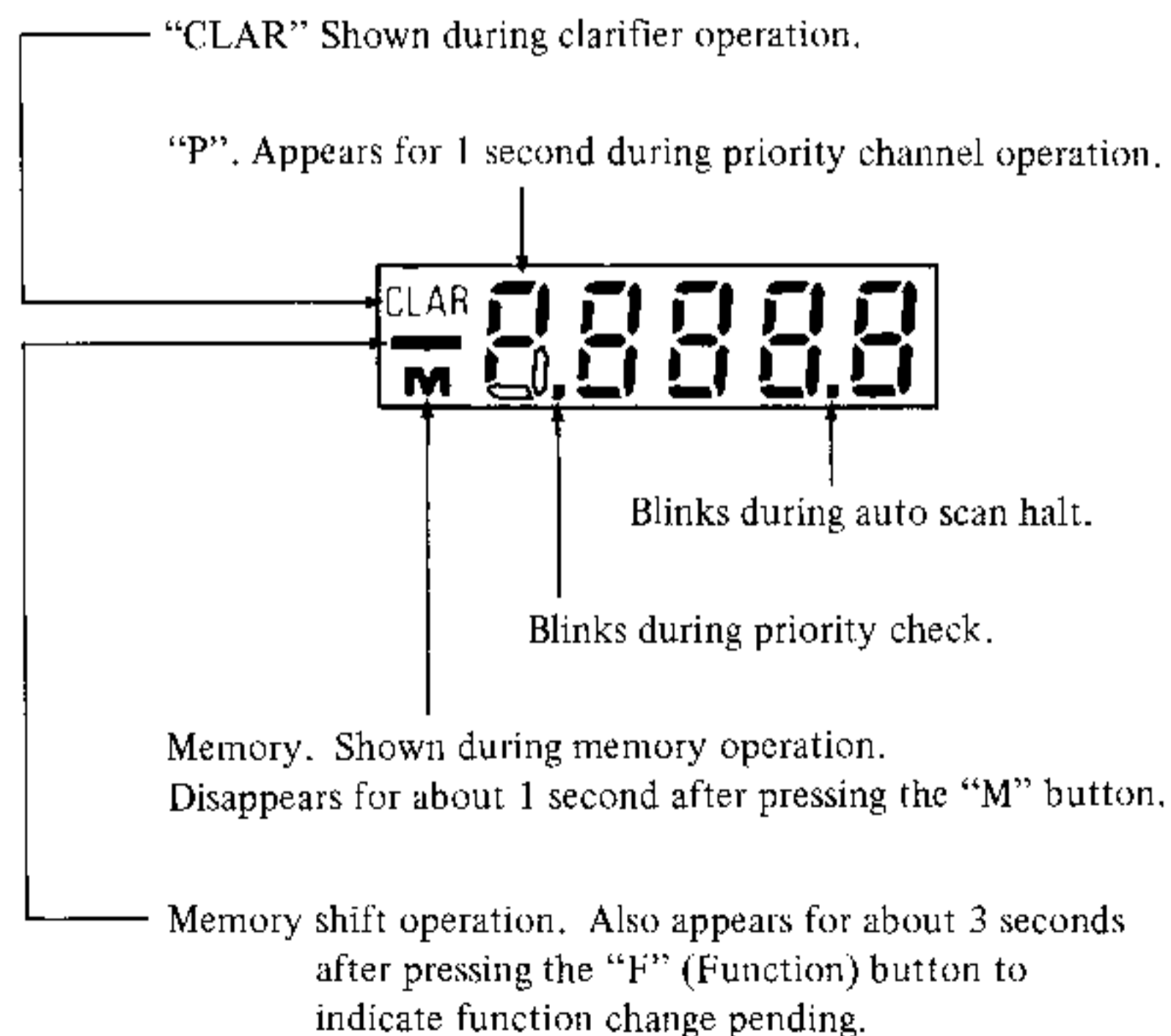
The digital display uses an LCD for indication of the operating frequency and mode. The frequency readout displays the last five digits of the operating frequency, with resolution to 0.1 kHz. Indicators are also provided for indication of clarifier operation ("CLAR"), priority channel operation ("P"), memory channel operation ("M"), or memory split operation ("—" on transmit).

### (18) S/PO METER

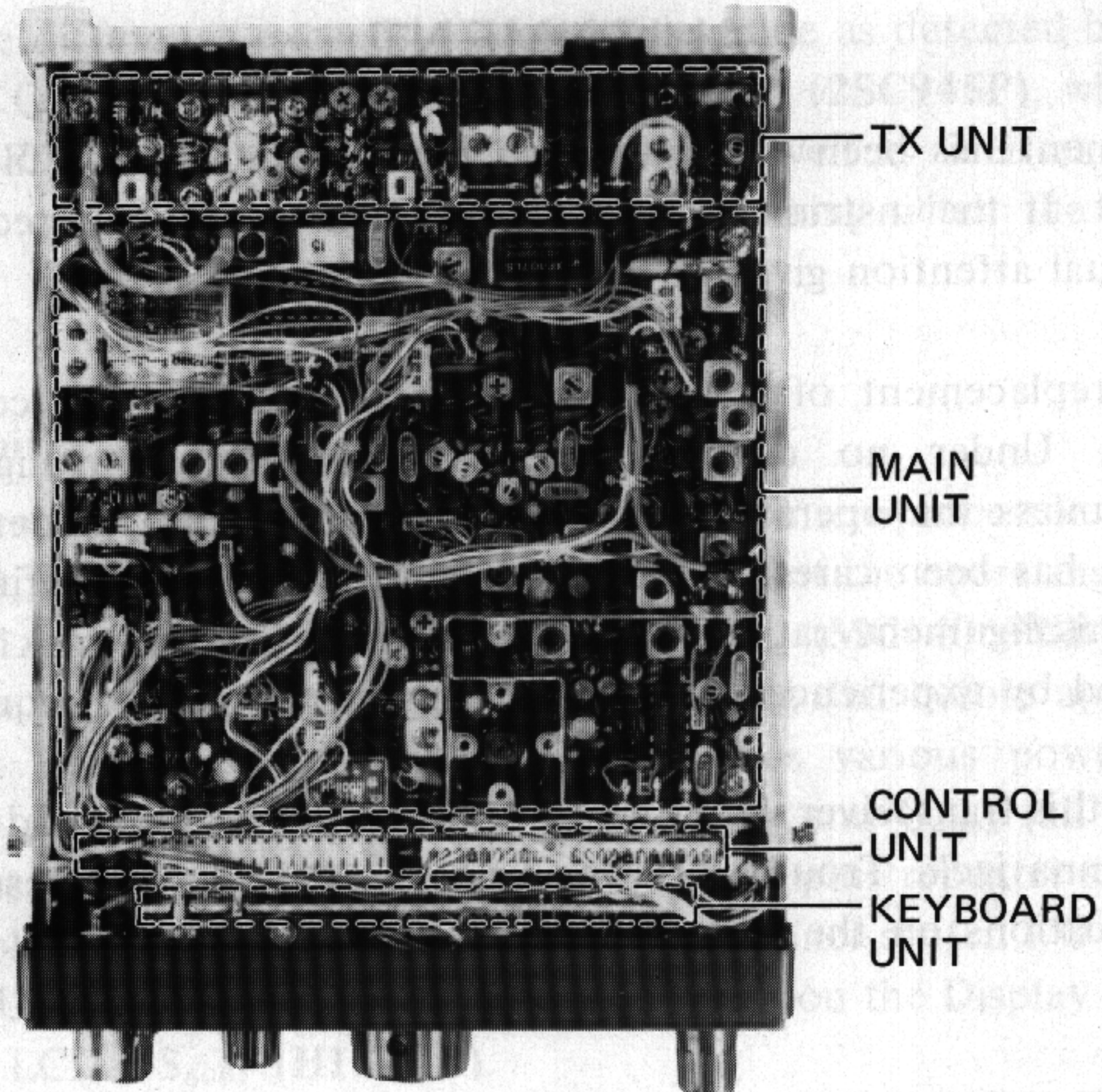
The meter allows determination of incoming signal strength and relative power output. The meter is also used for checking battery condition.

### (19) ANTENNA

The ANTENNA jack is a BNC type connector for quick connection of the rubber flex antenna or an external antenna.





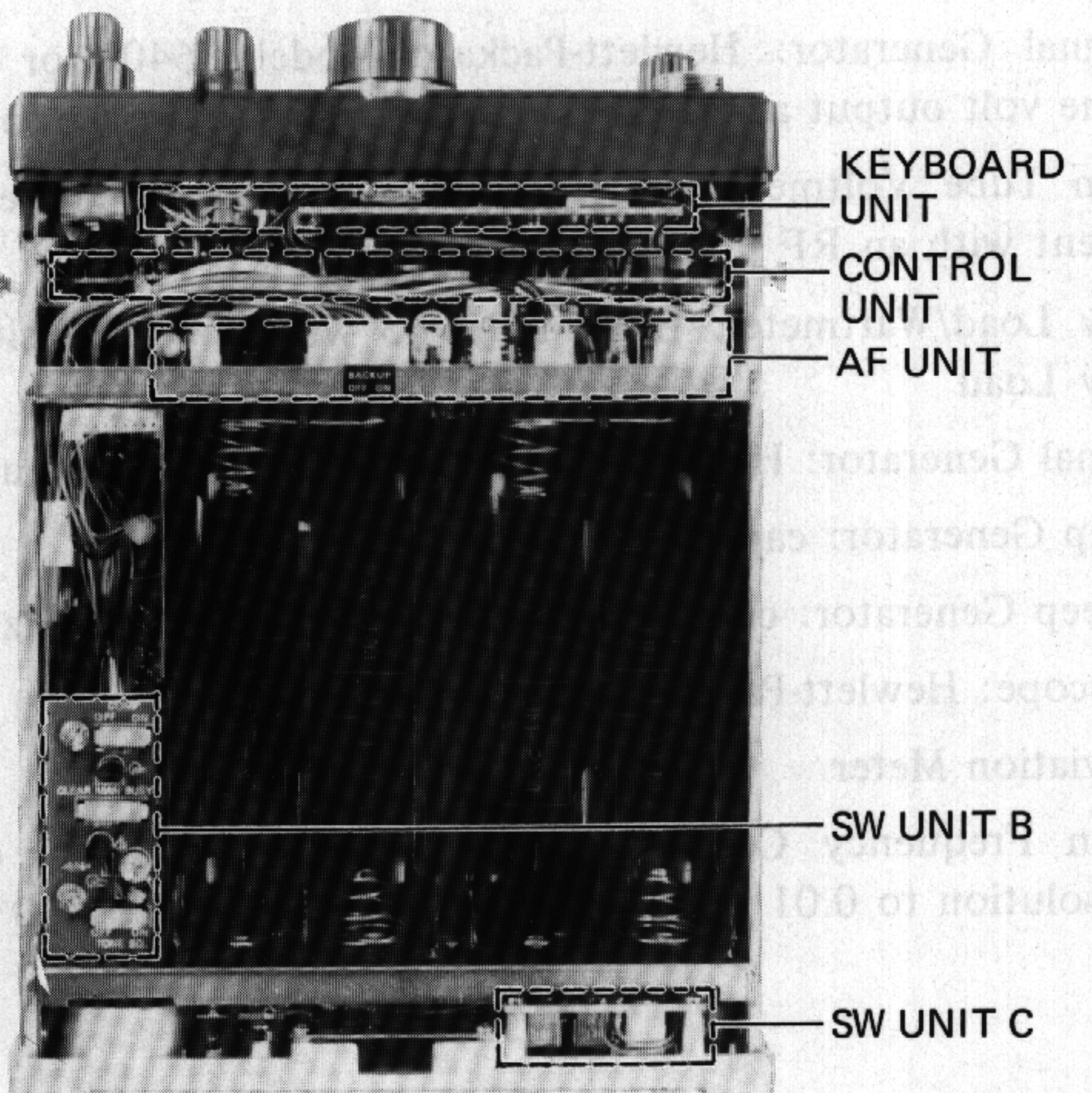


TX UNIT

MAIN UNIT

CONTROL UNIT

KEYBOARD UNIT



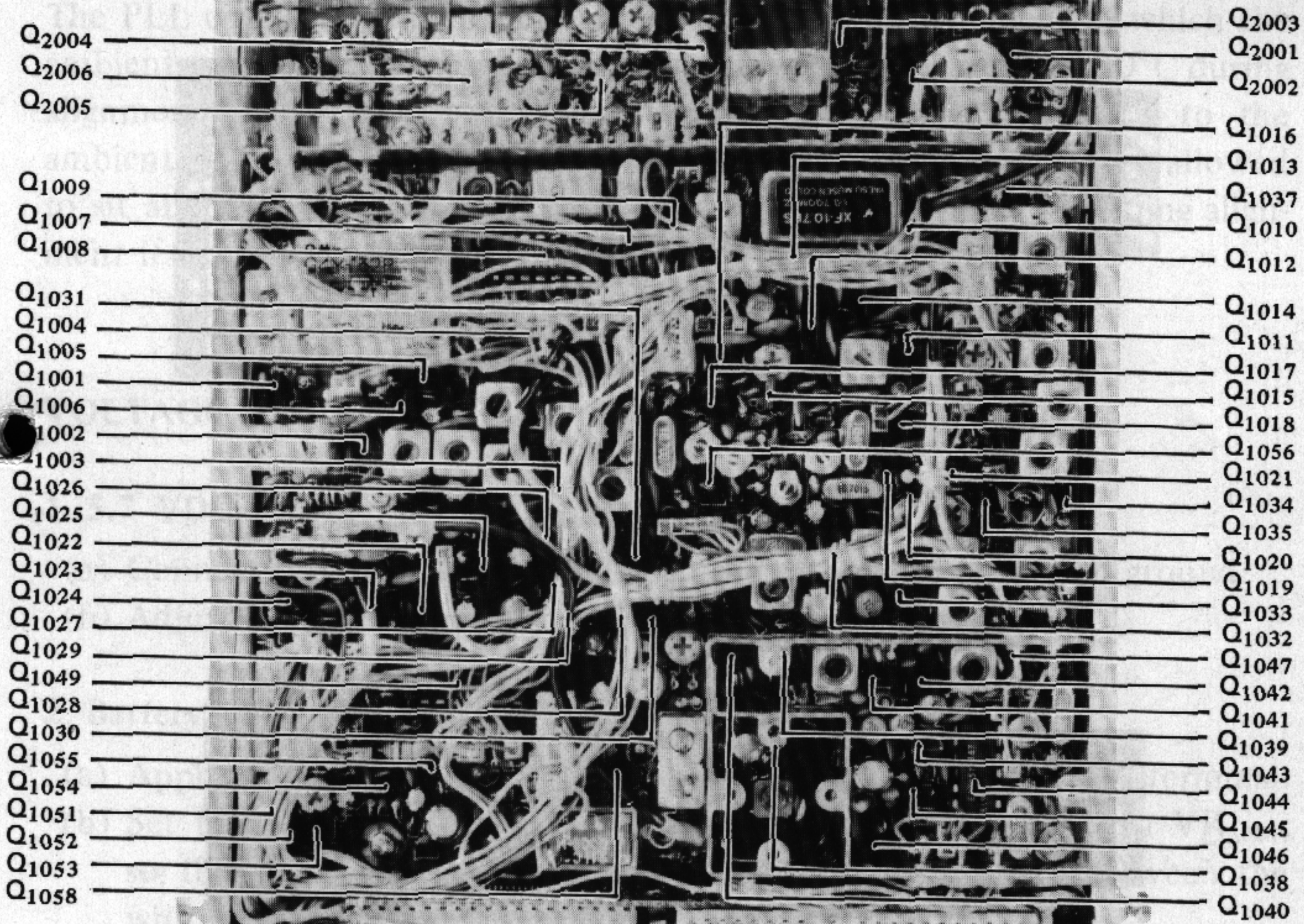
KEYBOARD UNIT

CONTROL UNIT

AF UNIT

SW UNIT B

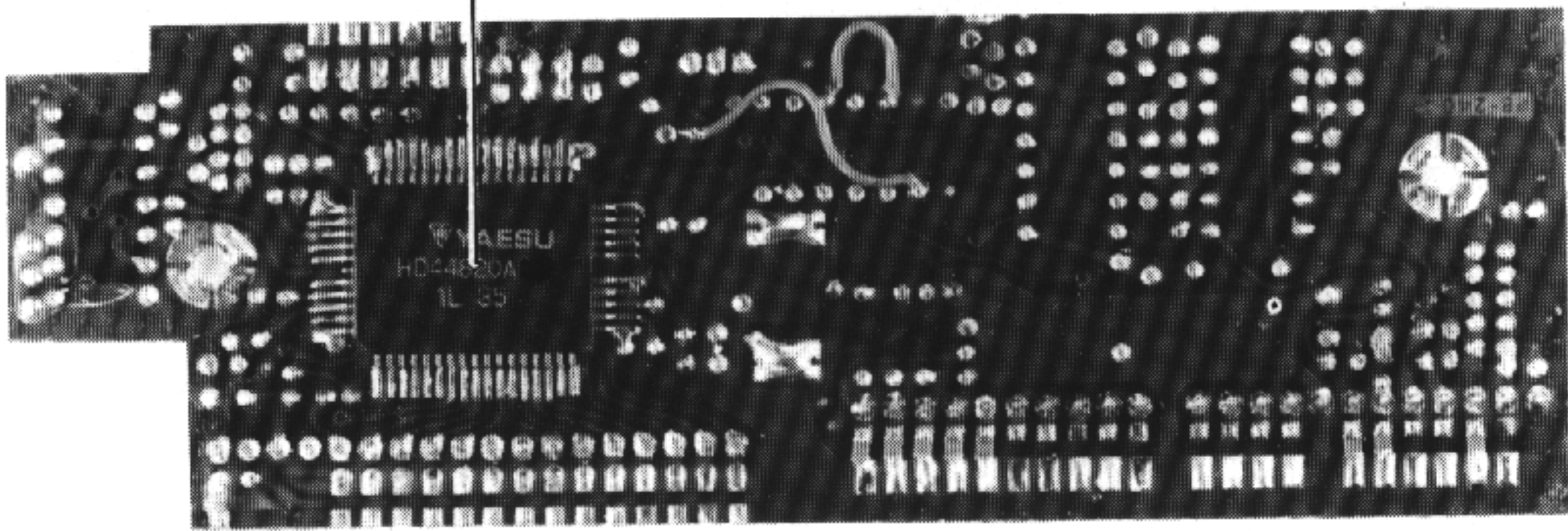
SW UNIT C



Q2004  
Q2006  
Q2005  
  
Q1009  
Q1007  
Q1008  
  
Q1031  
Q1004  
Q1005  
Q1001  
Q1006  
Q1002  
Q1003  
Q1026  
Q1025  
Q1022  
Q1023  
Q1024  
Q1027  
Q1029  
Q1049  
Q1028  
Q1030  
Q1055  
Q1054  
Q1051  
Q1052  
Q1053  
Q1058

Q2003  
Q2001  
Q2002  
  
Q1016  
Q1013  
Q1037  
Q1010  
Q1012  
  
Q1014  
Q1011  
Q1017  
Q1015  
Q1018  
Q1056  
Q1021  
Q1034  
Q1035  
Q1020  
Q1019  
Q1033  
Q1032  
Q1047  
Q1042  
Q1041  
Q1039  
Q1043  
Q1044  
Q1045  
Q1046  
Q1038  
Q1040

Q4001

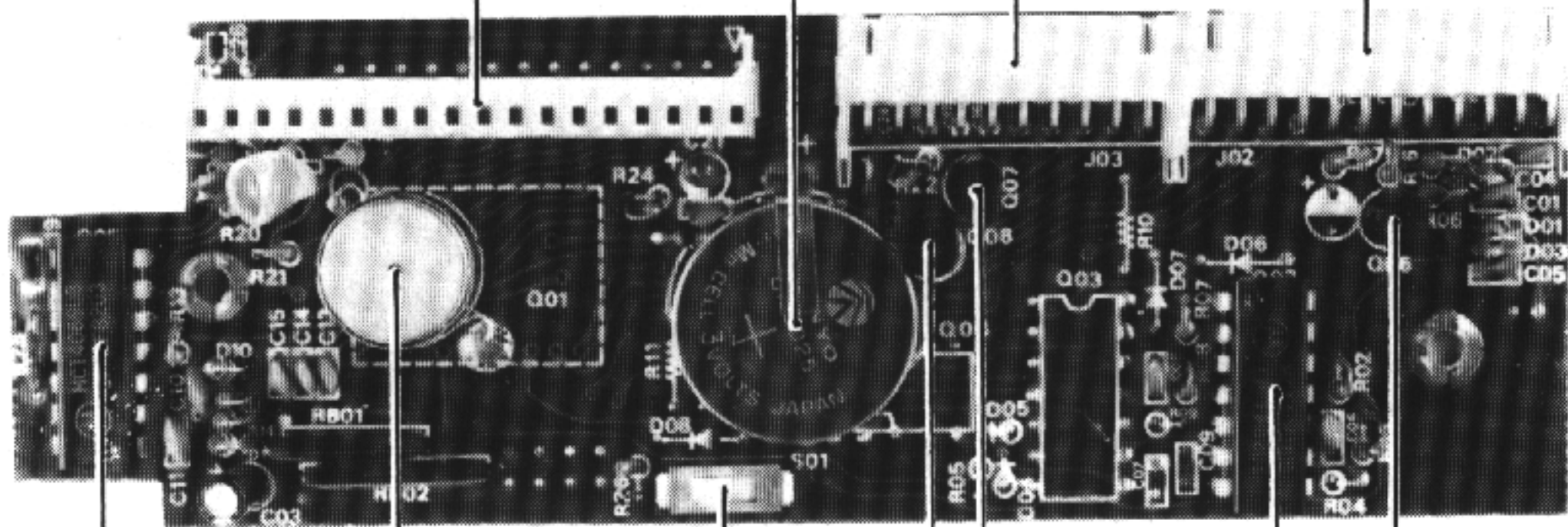


J4001

BAT4001

J4003

J4002



Q4005

BZ4001

S4001  
(BACKUP)

Q4008

Q4007

Q4002

Q4006

F3001

Q3007

Q3002

Q3001

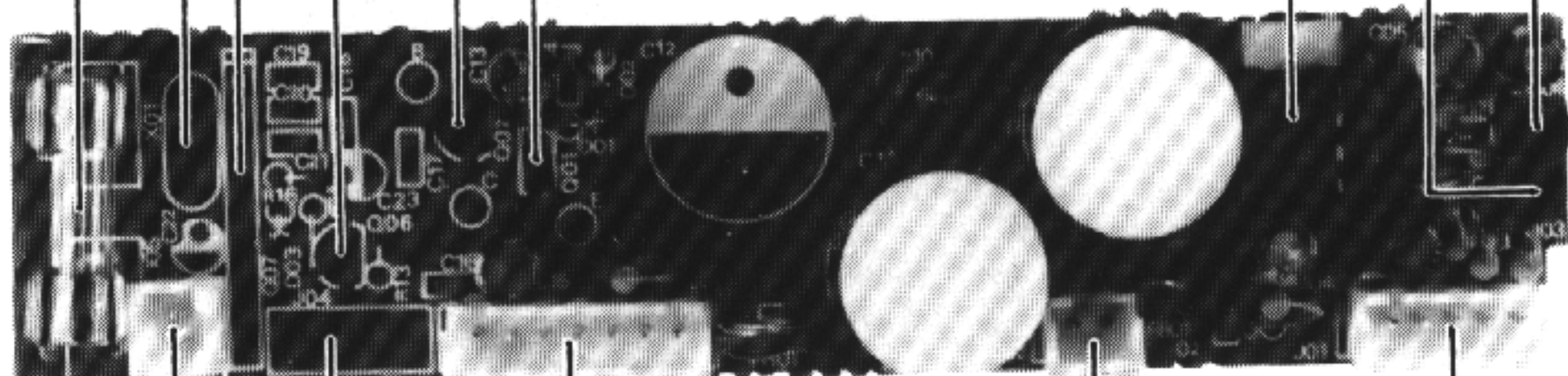
Q3005

Q3003

Q3004

X3001

Q3006



J3005

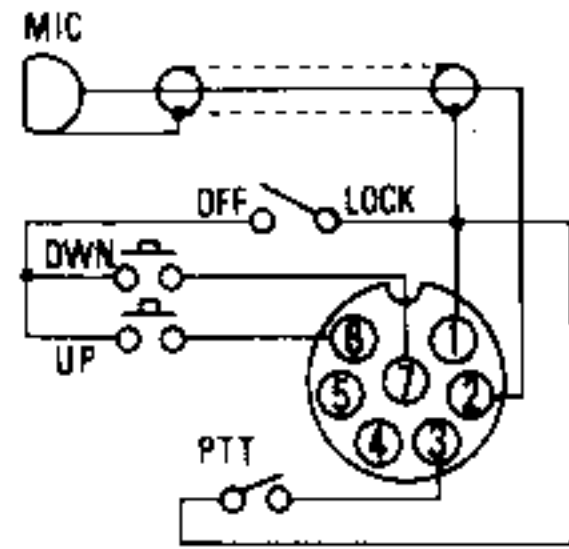
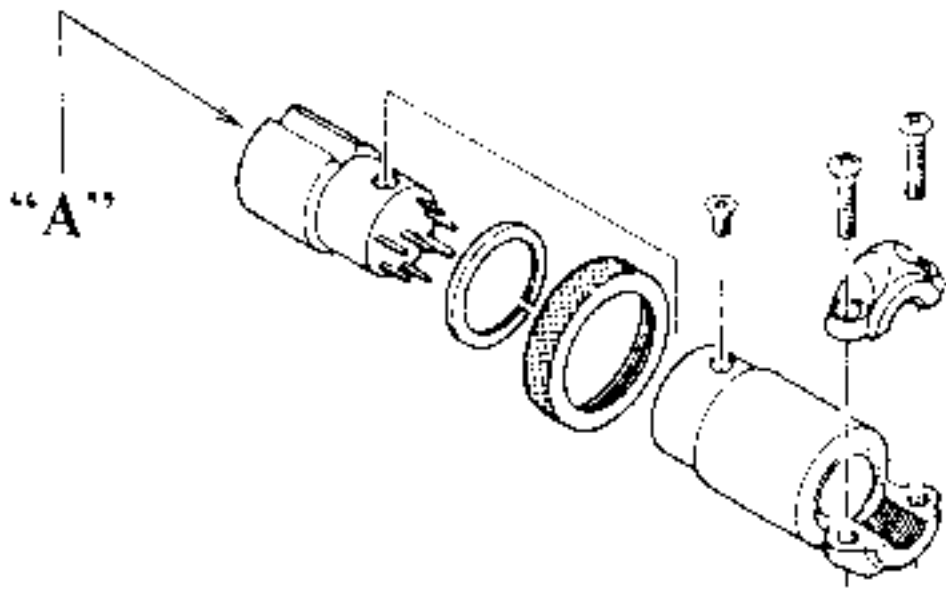
J3004

J3003

J3002

J3001

# MICROPHONES



Viewed from "A" Side

## MICROPHONE PLUG CONNECTIONS

YM-47

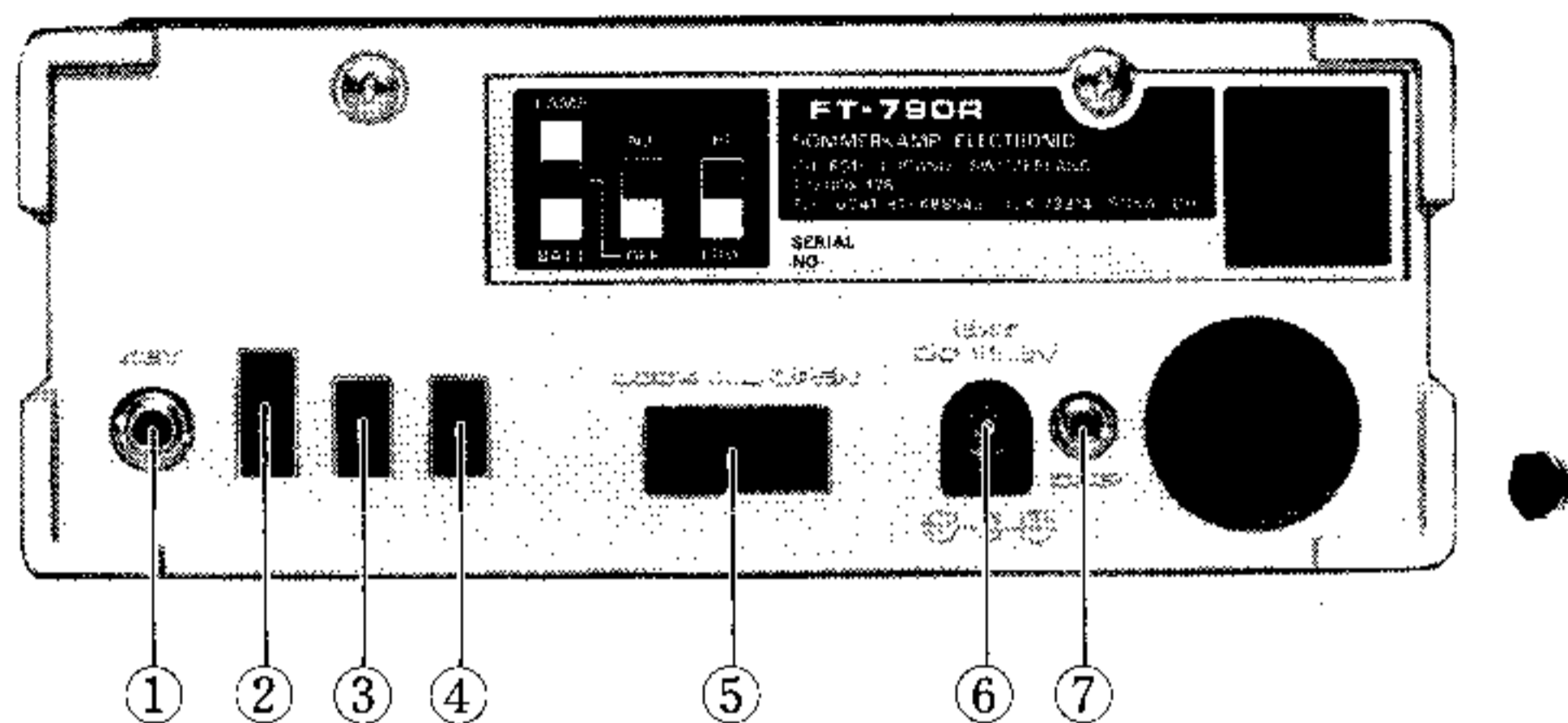


YM-49  
OPTIONAL SPEAKER  
MICROPHONE



YM-50  
OPTIONAL DTMF  
MICROPHONE

# REAR APRON SWITCHES AND JACKS



## (1) KEY

This jack is used for the keying input line. Use a miniature phone plug for connection to your telegraph key or keyer. The key-up voltage is 7V, and the key-down current is 0.3 mA.

## (2) LAMP/BATT

With this switch in the LAMP position, the front panel meter and display will become illuminated for nighttime operation. If the power switch (on the VOL control) is off, this lamp will stay off, thus preventing inadvertent battery discharge.

In the BATT position, the battery voltage is checked. The meter needle should deflect at least to the dividing line between the green and white zones of the meter scale. If not, the batteries require replacement or recharging.

## (3) NB

This switch activates the built-in noise blanker. This blanker helps in minimizing pulse-type noise such as that caused by automotive ignition systems.

## (4) HI/LOW

This switch selects power outputs of 1.0 watt (HI) or 0.2 watt (LOW).

## (5) CASE LATCH

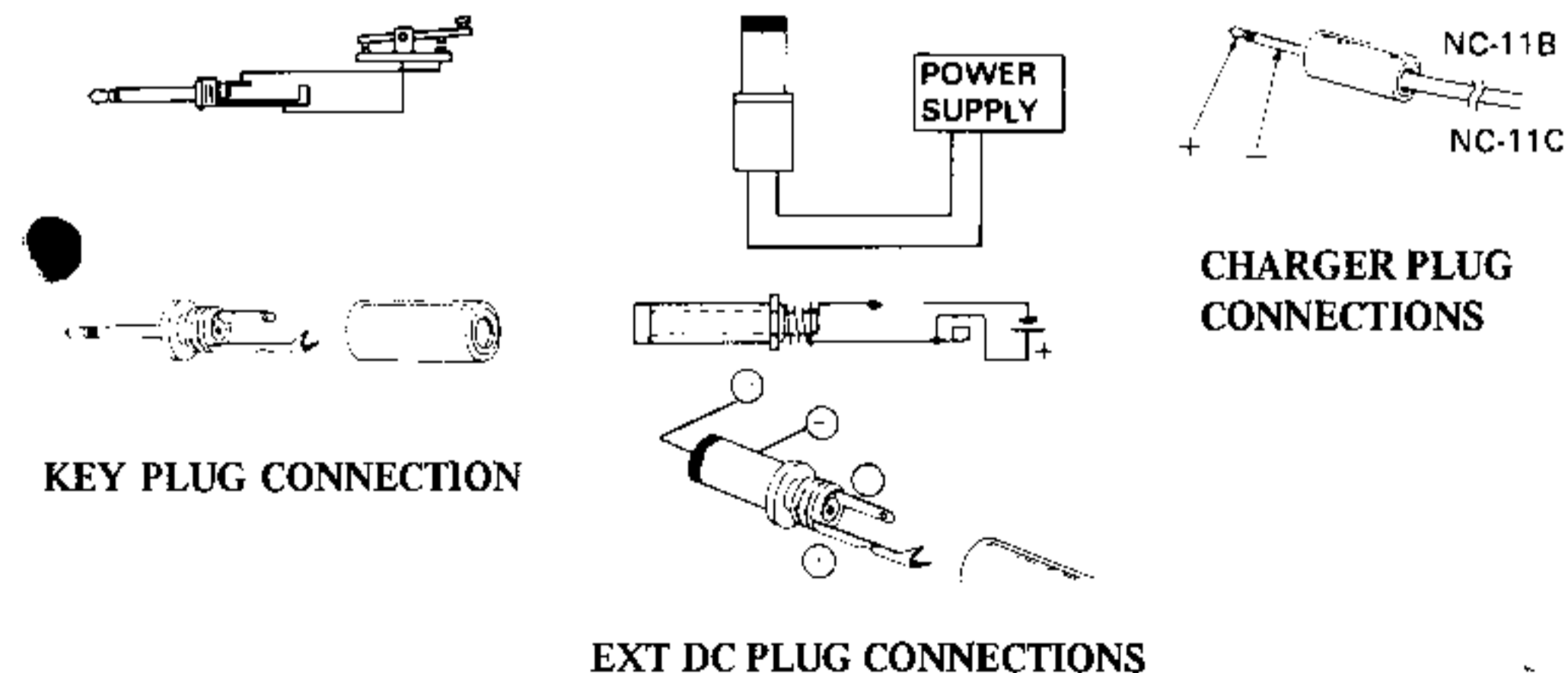
This mechanism provides easy opening and closing of the cabinet for battery replacement.

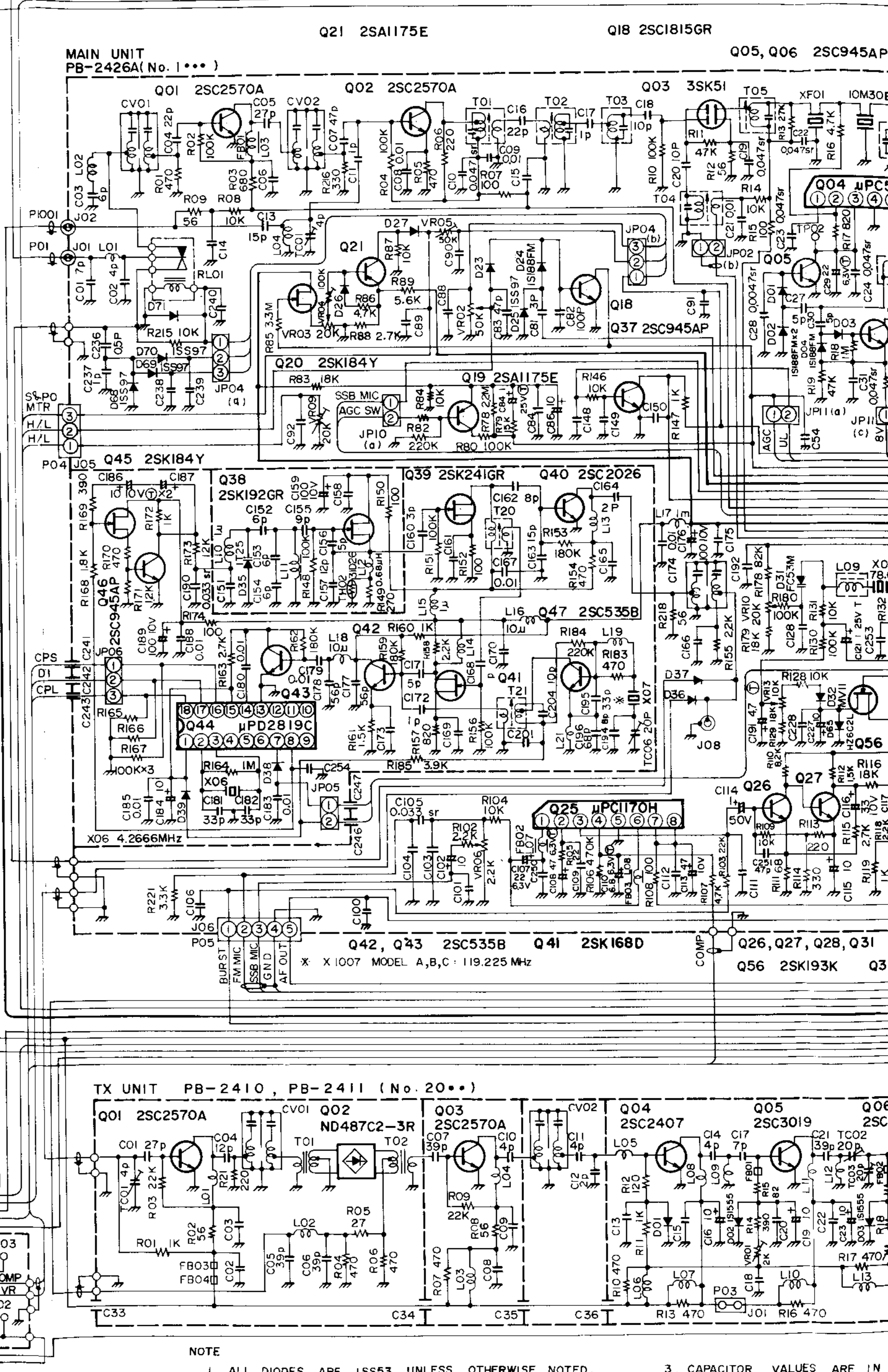
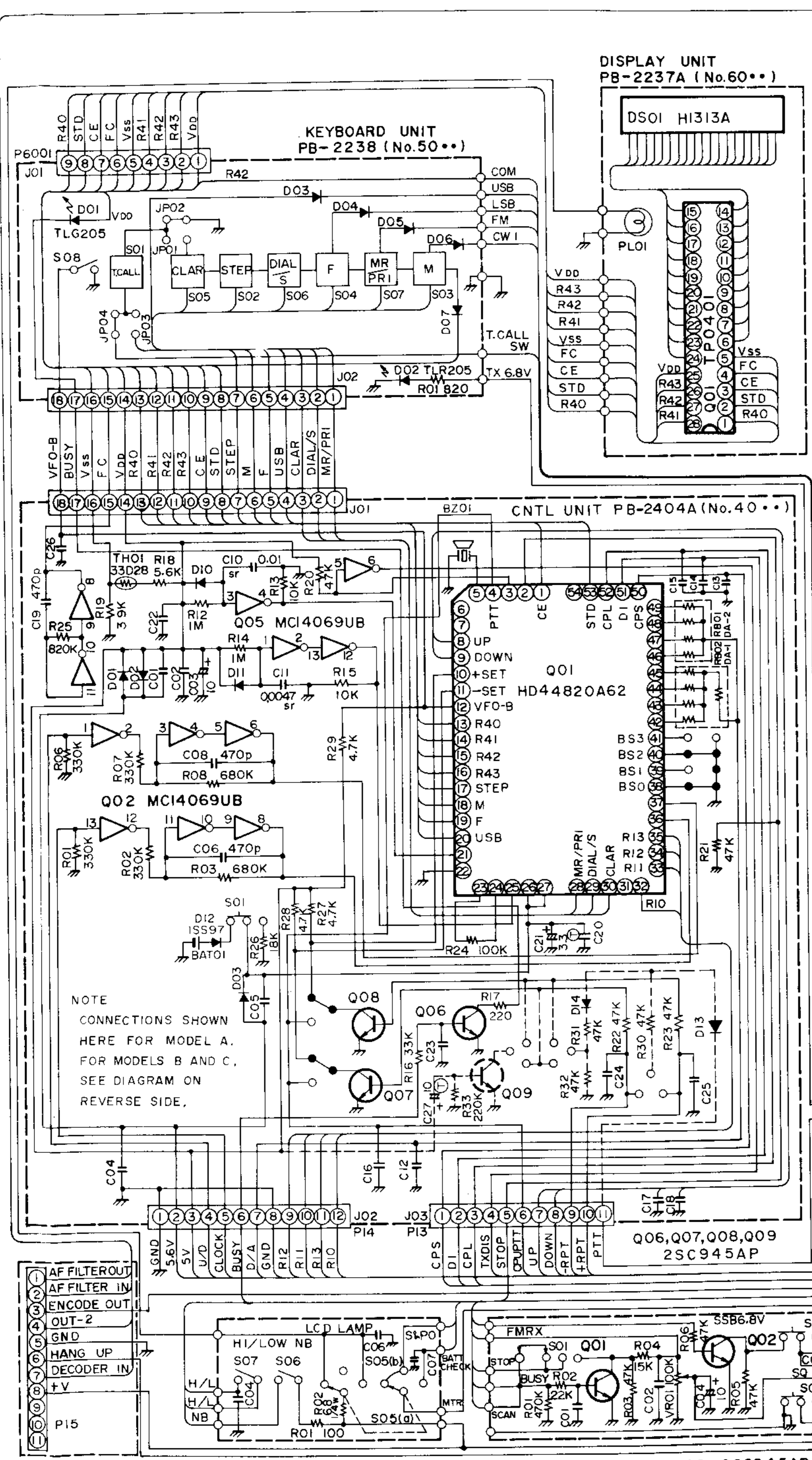
## (6) EXT DC 13.8V

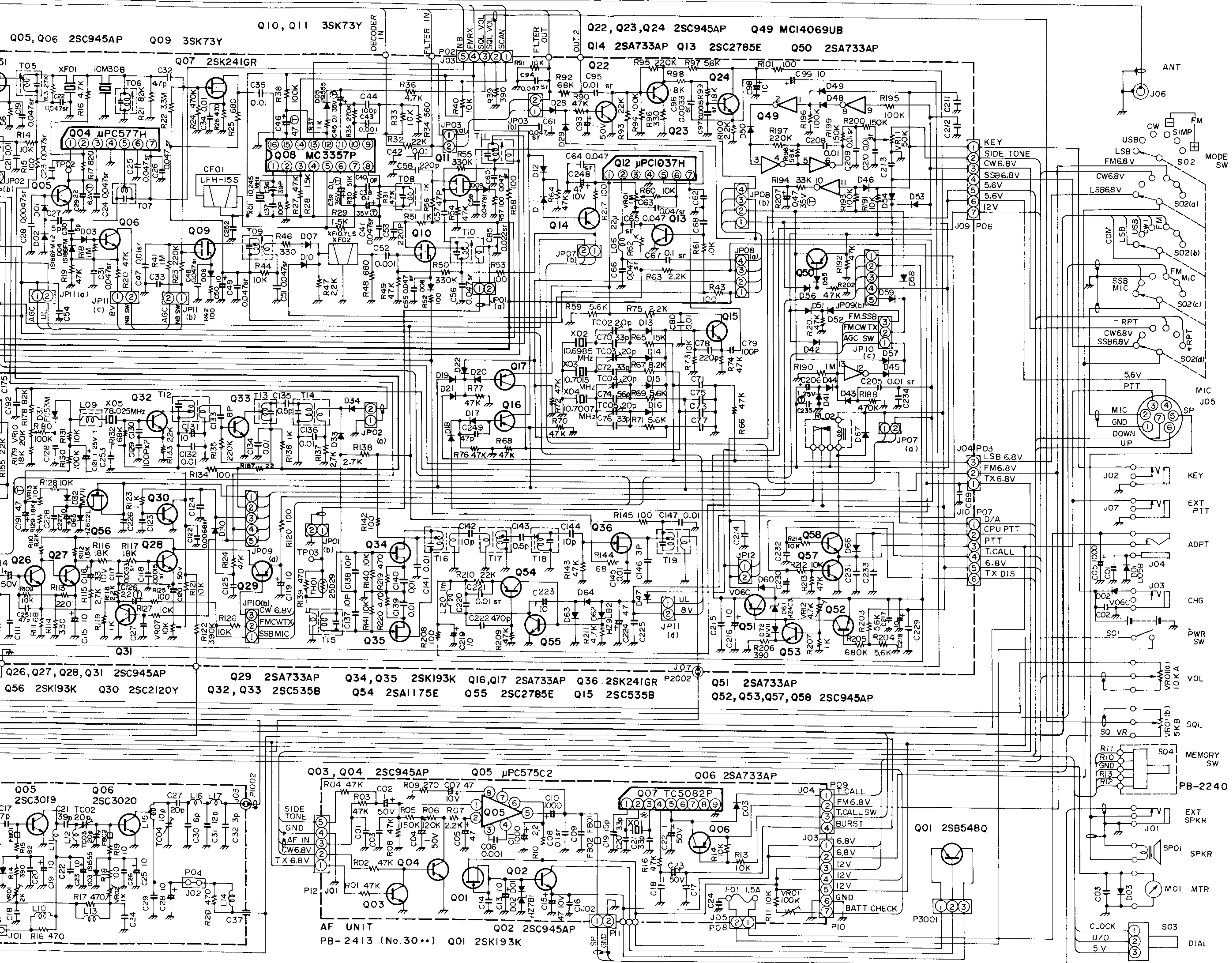
Use this jack for connection to an external DC supply. Never exceed 15 volts at this jack, and never apply AC power of any kind at this point. Also, be absolutely certain that DC power of the proper polarity is applied; when replacing DC plugs, check to be sure that the plug is wired correctly, as there is no standardized wiring polarity for the power plug used for the FT-790R. Failure to observe these simple precautions will void any and all warranties on this equipment.

## (7) CHG

The external charge jack accepts charging voltage from the NC-11B/C battery charger (option). When using alkaline or other dry cell batteries, do not attempt to recharge them. Use only C size Ni-Cd cells (available from your Yaesu dealer) if you intend to recharge the cells.







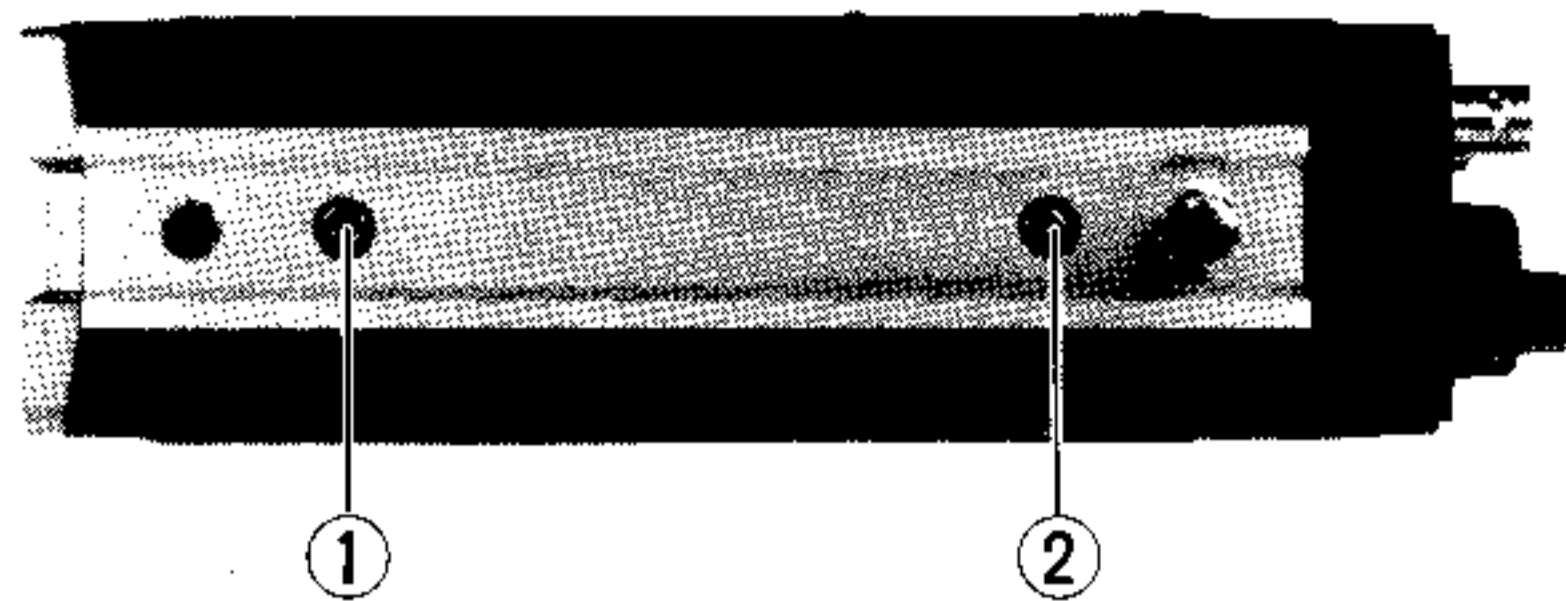
RESISTOR VALUES ARE IN  $\mu$ F, 50WV; EXCEPT ELECTROLYTICS, WHICH ARE 16WV; RESISTOR VALUES ARE IN  $\Omega$ , 1/8W.

INDUCTOR VALUES ARE IN HENRIES UNLESS OTHERWISE NOTED.

X: X3001 MODEL A: 7.3728 MHz  
MODEL B,C: 7.168 MHz

**FT-790R**  
CIRCUIT DIAGRAM

## SIDE PANEL JACKS

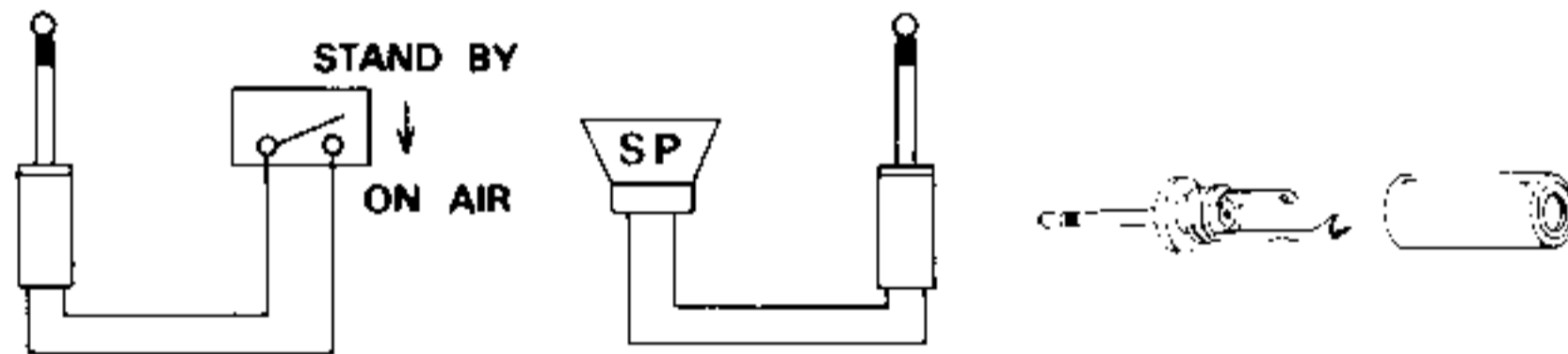


### (1) STAND BY

This jack is wired in parallel with the PTT line of the microphone, allowing the use of a footswitch to activate the transmitter.

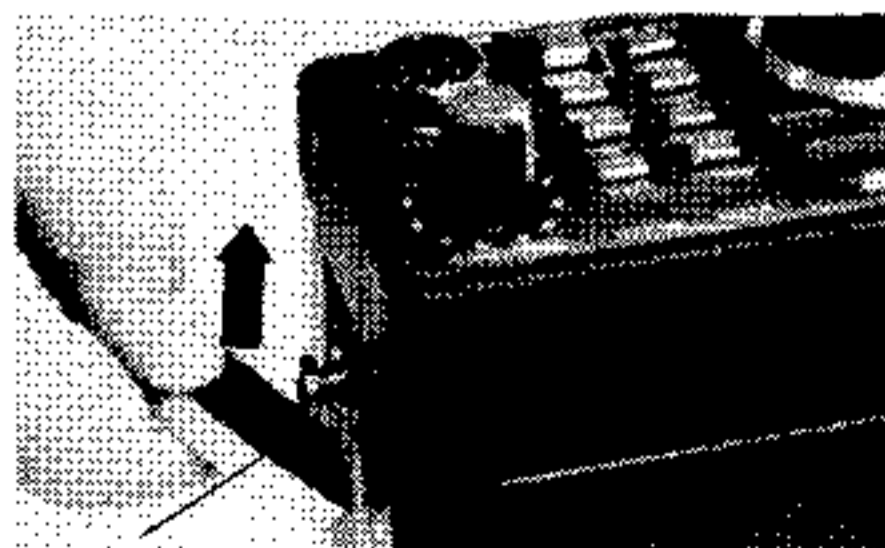
### (2) EXT SP

Use this jack to connect an external speaker. The output impedance is 8 ohms.



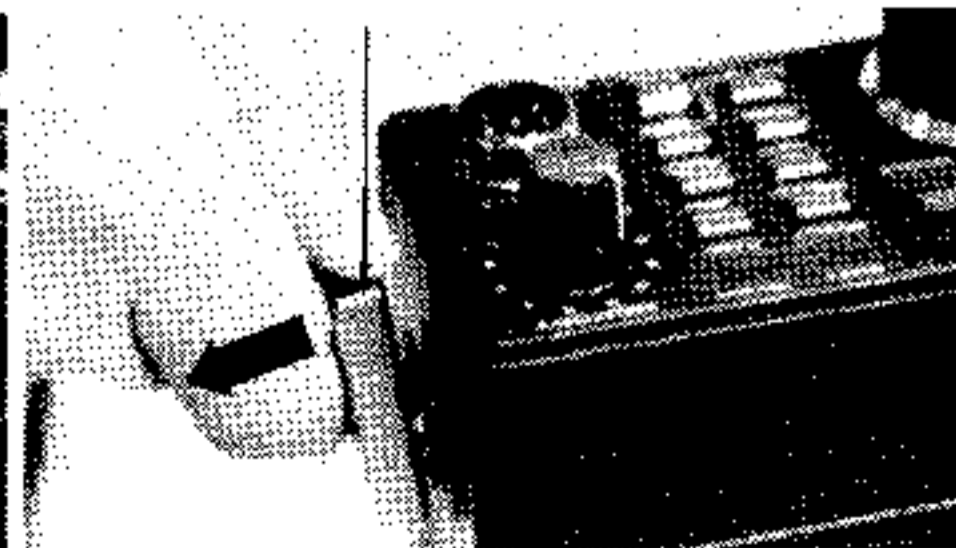
## SHOULDER STRAP ATTACHMENT AND REMOVAL

### ATTACHMENT



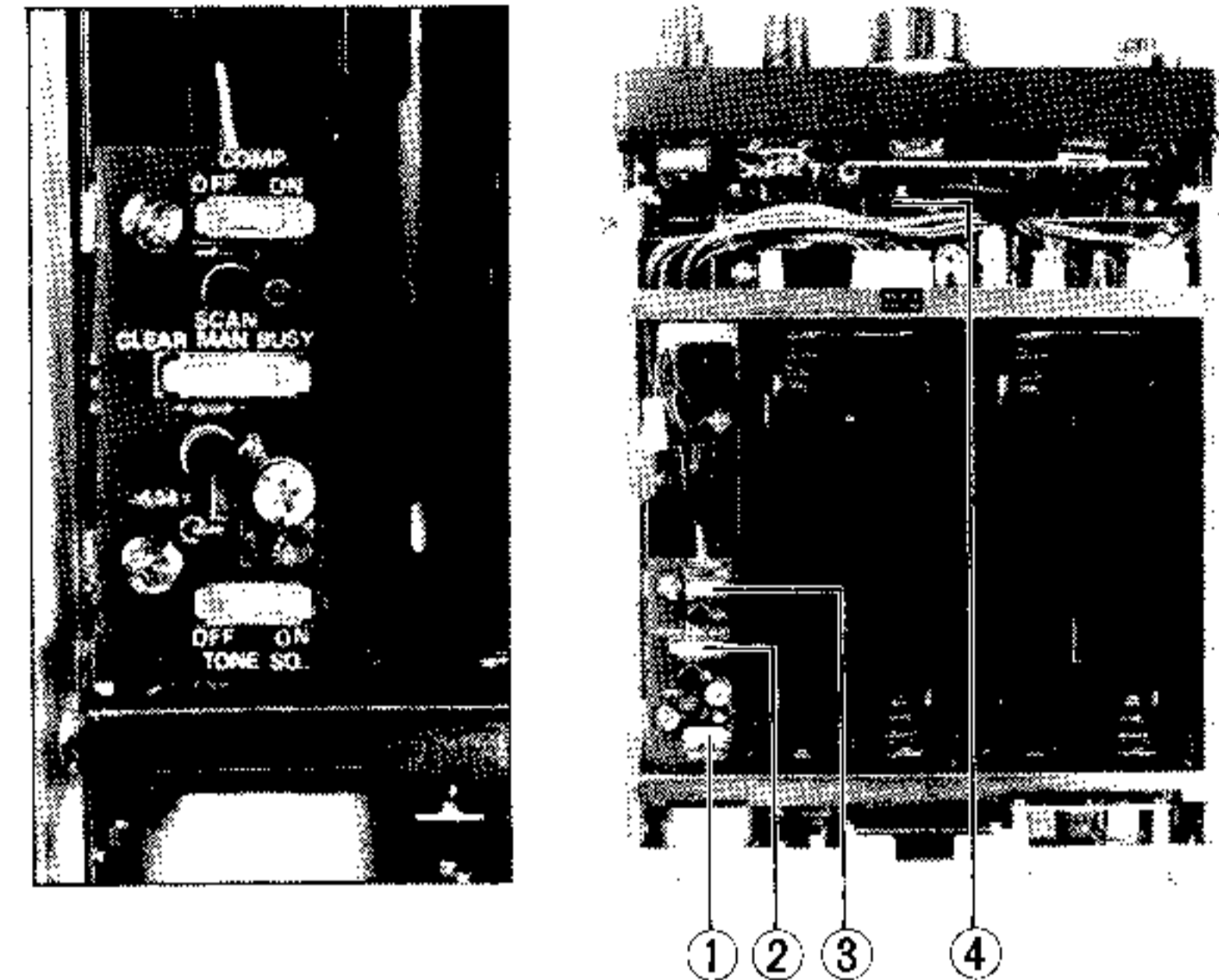
Press pin into hole, then pull up tab.

### REMOVAL



Press with thumb while lifting tab, swiveling back and forth slightly until pin disengages.

## INTERNAL SWITCHES



### (1) TONE SQ.

When the optional tone squelch unit is installed, this switch will place the unit in operation.

### (2) SCAN

This switch selects automatic scan stop on a busy or clear channel, per your requirements. Manual scanning can also be selected, if desired.

### (3) COMP

This switch activates the audio speech compressor for the SSB and FM modes. Average power in the SSB mode will be increased, with some loss of fidelity.

### (4) BACKUP

This switch activates the lithium memory backup feature, and may be turned on and left on indefinitely. See the Operation section for details.



# SPECIFICATIONS

## GENERAL

**Frequency coverage:**  
430.0 – 440.0 MHz

**Modes of operation:**  
SSB (USB, LSB), CW and FM

**Synthesizer steps:**  
SSB/CW: 100 Hz, 1 kHz  
FM: 25 kHz, 100 kHz

**Power requirements:**  
8 C - size dry battery cells or  
8 C - size Ni-Cd battery cells  
External: 8 – 15V DC  
Memory backup: built-in lithium bat-  
tery cell

**Current consumption:**  
100 mA on receive; (FM)  
750 mA on transmit (1W RF, FM)

**Antenna impedance:**  
50 ohms

**Case size:**  
58(H) x 150(W) x 195(D) mm

**Weight:**  
1.3kg. without batteries

## TRANSMITTER

**Power output:**  
1 watt at 12 volts

**Carrier suppression:**  
Better than 40 dB

**Spurious radiation:**  
Better than –50 dB

**Unwanted sideband suppression:**  
Better than 40 dB

**Tone burst frequency:**  
1800 Hz (A model)  
1750 Hz (other models)

**Frequency response:**  
300 – 2700 Hz (–6 dB)

**FM deviation:**  
±5 kHz

**Microphone impedance:**  
600 ohms

## RECEIVER

**Circuit type:**  
SSB/CW: Double conversion  
superheterodyne  
FM: Triple conversion  
superheterodyne

**Intermediate frequencies:**  
1st IF 67.3 MHz  
2nd IF 10.7 MHz  
3rd IF 455 kHz (FM)

**Sensitivity:**  
SSB/CW: 0.16 $\mu$ V for 10 dB S/N  
FM: 0.25 $\mu$ V for 12 dB SINAD

**Selectivity:**  
SSB/CW: 2.4 kHz at 6 dB down;  
4.1 kHz at 60 dB down  
FM: 12 kHz at 6 dB down;  
25 kHz at 60 dB down

**Image rejection:**  
Better than –60 dB

**Audio output impedance:**  
8 ohms

**Audio output:**  
1 watt @10% THD

## RPT SHIFT

Model A ±5 MHz  
Model B –7.6 MHz, REV  
Model C +1.6 MHz, REV

# SEMICONDUCTORS

## ICs:

HD44820-A62	1
MC3357P	1
MC14069UB	3
ND487C2-3R	1
(Ring Module)	
TP0401	1
$\mu$ PC575C2	1
$\mu$ PC577H	1
$\mu$ PC1037H	1
$\mu$ PC1170H	1
$\mu$ PD2819C	1
TC-5082P	1

## FETs:

2SK168D	1
2SK184Y	2
2SK192GR	1
2SK193K	4
2SK241GR	3
3SK51-03	1
3SK73Y	3

## Transistors:

2SA733AP	7
2SA1175E	3
2SB548P	1
2SC535B	6
2SC945AP	21
2SC1815GR	1
2SC2026	1
2SC2120Y	1
2SC2407	1
2SC2570A	4
2SC2785E	2
2SC3019	1
2SC3020	1

## Diodes:

1S188FM (Ge)	4
1S1555 (Si)	3
1SS53 (Si)	67
1SS97	5
(Schottky Barrier)	
1T25 (Varactor)	1
FC53M-4 (Varactor)	6
HZ4C3 (Zener)	1
HZ6C2L (Zener)	1
HZ7B1 (Zener)	1
HZ9B2L (Zener)	1
MV-11 (Varistor)	2
TLG205 (LED)	1
TLR205 (LED)	1
U05B (Si)	1
V06C (Si)	2

## Liquid Crystal Display:

H1313A	1
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# ACCESSORIES

Whip Antenna	(Q3000031)	1
Microphone	(M3090033)	1
Microphone Hanger	(R0071360)	1
Shoulder Strap	(R7070600)	1
External DC Plug	(P1090139)	1
External Speaker Plug	(P0090034)	1

Specifications subject to change without notice or obligation.