

INSTRUCTION MANUAL

FT-75B

YAESU MUSEN CO., LTD.

TOKYO JAPAN.

FT-75B
SSB/CW TRANSCEIVER



GENERAL DESCRIPTION

The model FT-75B is compact, lightweight SSB/CW transceiver for crystal control or external VFO, five bands 80 thru 10 meter with all solid-state receiver and hybrid transmitter. The matching power supplies, FP-75B (AC) and DC-75B (DC), incorporate built-in speaker and can be adjusted to vary the transceiver power input from approximately 30 watts P. E. P. on low tap of HT power transformer secondary to approximately 100 watts P. E. P. on high tap.

Transmitter is pre-tuned for quick QSY, and coupled with features of compactness, low current drain, noise blanker and squelch. This makes it an ideal transceiver for simple and safe mobile operation as well as for home station use.

SPECIFICATIONS

Transmitter and Receiver Operating Frequency Range:

| | |
|-----|---------------------------|
| 80m | 100 KHz bandwidth segment |
| 40m | 100 KHz bandwidth segment |
| 20m | 150 KHz bandwidth segment |
| 15m | 240 KHz bandwidth segment |
| 10m | 400 KHz bandwidth segment |

Useful output is available over approximately twice the bandwidth quoted, with some drop off at the segment edges.

Transmitting Modes: SSB (A3j) - 3.5 MHz and 7.0 MHz LSB
SSB (A3j) - 14 MHz thru 28 MHz USB
CW (A1) - All bands

Final Input Power: LOW setting - 30 watts DC
HIGH setting - 100 watts DC

Sideband Suppression: Better than 40 dB

Transmitter Audio Bandwidth: 400 to 2700 Hz \pm 3 dB

Receiver Sensitivity: Better than 0.5 μ V for 10 dB S/N ratio

Selectivity: 2.3 KHz at -6 dB
4.5 KHz at -60 dB

Audio Output Impedance: 4 ohms unbalanced

Audio Output: 2 watts at 10% distortion

Operating Voltages: FP-75B (100/110/117/200/220/234V AC
50/60 Hz)
DC-75B (13.5V DC negative ground)

Power Requirements: FP-75B, DC-75B (13.5V)
30VA 0.3 A Receive Heater off (DC)
1.95A Receive Heater on (DC)
50VA 6.7 A Transmit no mod.
250VA 15.5 A Transmit with mod.

When power transformer HT secondary taps are set to high taps, the current drain will be approximately 20% higher.

Dimensions: 210 (W) x 80 (H) x 300 (D) mm

Weight: 3.8 Kg

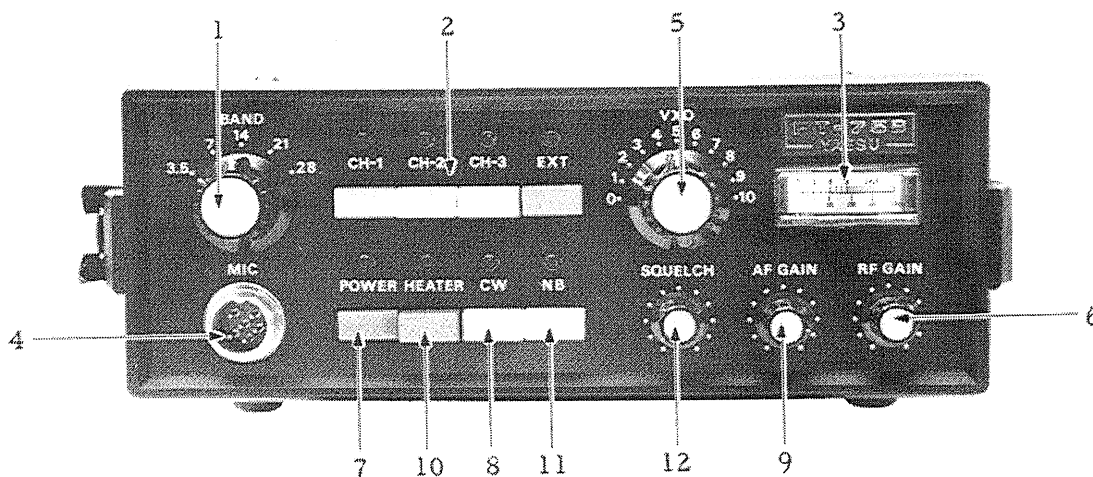
Tubes and Semiconductors:

| | |
|------------|---|
| Tube | 1 x 12BY7A 2 x 12GB7 |
| Transistor | 4 x 2SC373 8 x 2SC372Y 1 x 2SD313D 3 x 2SC784R |
| FET | 6 x 2SK19GR 1 x 3SK39Q |
| IC | 1 x AN214 1 x TA7045M |
| Diode | 9 x 1S1007 7 x 1S188FM 4 x V06B 1 x WZ061 3 x WZ110 1 x LD3141 |

ACCESSORIES

1. Dynamic microphone YM-86
2. 5 pin plug for external VFO/VXO
3. Plug for key
4. Coax plug for antenna
5. TCA phone plug for use with transvertor
6. 7 pin plug for connecting to external remote circuits
7. VXO frequency card (indicates frequency supplied with FT-75B VXO and position on VXO knob for basic frequency)
8. Plastic alignment tool

FRONT CONTROLS AND SWITCHES

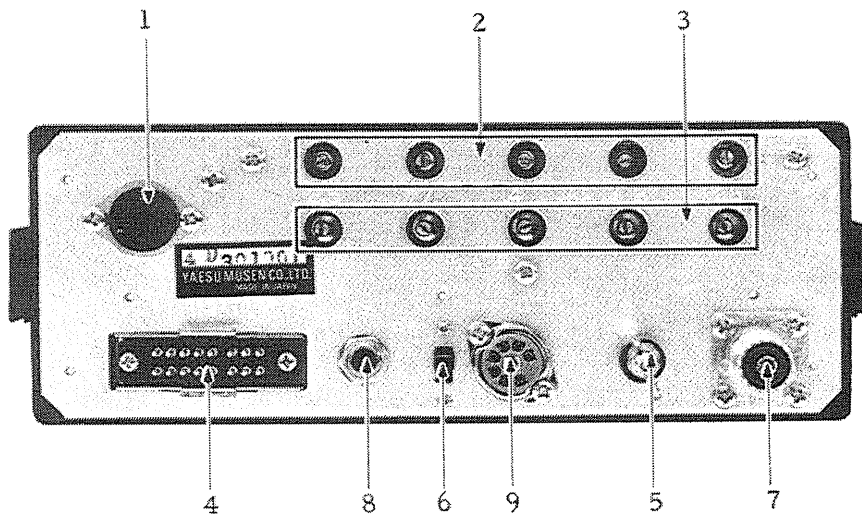


1. BAND - Band selection switch for 3.5 thru 28 MHz.
2. CHANNEL SELECTOR - Selects internal crystals for internal VXO. A light indicates the selected channel, CH1.

CH2, CH3 and EXT for external VFO or external VXO.

3. METER - The front panel meter acts as an "S-Meter" on receive and shows final plate current or relative output on transmit.
4. MIC - Microphone jack, or VOX (option) connection.
5. VXO - Variable crystal oscillator shifts frequency of crystals slightly. The dots do not have any frequency significance.
6. RF GAIN - This controls RF and IF gain.
7. POWER - Power ON/OFF switch.
FP-75B operation - This switch turns RX on and TX heaters on.
DC-75B operation - This switch turns RX only on.
8. CW - This switch changes the carrier oscillator for CW and turns the FT-75B to transmit. Repress the switch for receive.
9. AF GAIN - Audio gain control.
10. HEATER - This switch is ineffective on AC operation, but when operating with the DC-75B it turns the TX heaters on or off.
11. N. B. - Press to turn noise blanker on, and repress to turn off.
12. SQUELCH - Turn clockwise to adjust threshold of squelch. Full counter-clockwise is off. The further the knob is turned clockwise the stronger a signal must be to open the squelch.

REAR CONTROLS AND SWITCHES



- | | |
|------------|---|
| 1. EXT | - For connection to EXT VFO or EXT VXO. This jack supplies power to the external device and also accepts the RF signal from it. |
| 2. LOADING | - Trimmers TC6 - TC10 for loading adjustment. |
| 3. PLATE | - Trimmers TC1 - TC5. Plate tuning capacitors. |
| 4. POWER | - Accepts power plug from FP-75B or DC-75B. |
| 5. GND | - For external ground connection. |
| 6. METER | - This switch selects the meter function on transmit, tube cathode current or relative power output. |
| 7. ANT | - Antenna connector (50 ohms). |
| 8. KEY | - Two contact key jack. |

9. REMOTE

One wafer of the band change switch is connected to this jack and may be used for remote switching of linear amplifier, antennas, relays, etc.

Pin 6 common connects with:

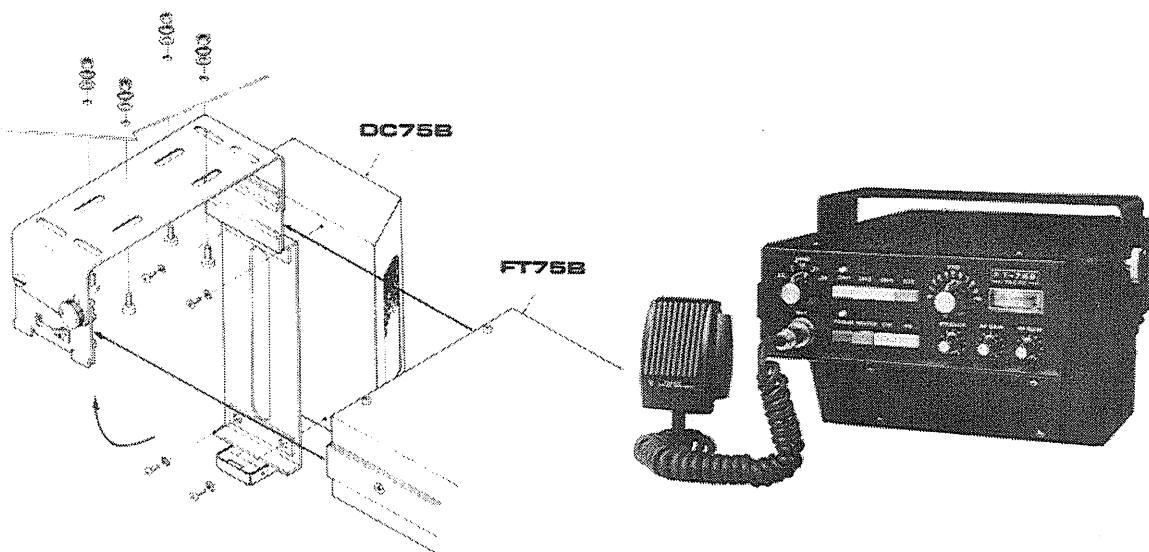
- Pin 1 - 80m
- 2 - 40m
- 3 - 20m
- 4 - 15m
- 5 - 10m

INSTALLATION

POWER SUPPLIES

(1) Mobile Use

Use the DC-75B and operate from 13.5 volt DC (negative ground) car battery. Connect the large cable with 16 pin plug to FT-75B and the red/black twin cord directly to battery terminals. This minimizes voltage drop and noise pick-up. Use the shortest possible lead length. Periodically check car voltage regulator and adjust to ensure that voltage does not rise above 14 volts.



FT-75B/DC-75B COMBINATION

CAUTION
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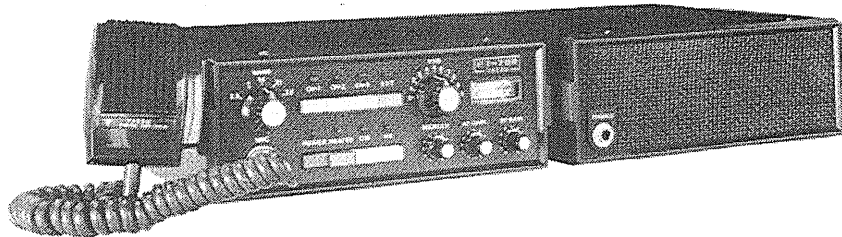
PERMANENT DAMAGE WILL RESULT IF HIGHER VOLTAGE THAN 14 VOLTS IS APPLIED TO THE TRANSCEIVER.

(2) Home Station Use

Use the FP-75B on 100-117V AC or 200-234V AC, 50/60 Hz. Make sure the FT-75B front panel power switch is in the OFF position before plugging FP-75B into AC mains, otherwise transient voltage spikes generated by initial intermittent contact may damage IC's and transistors.

CAUTION
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IT IS NOT RECOMMENDED THAT THE FT-75B TRANSCEIVER IS PLACED ON THE FP-75B POWER SUPPLY.



FT-75B/FP-75B COMBINATION

ANTENNAS

Any suitable antenna having 50 ohm impedance may be used, otherwise an antenna tuner is required.

GROUND

External grounding is necessary if mains grounding is poor or non-existent.

OPERATION

RECEIVER TUNING

- (1) Set the front panel controls as follows:

BAND*----- Desired band
CHANNEL ----- Desired channel or Ext.
POWER ----- Off
HEATER ----- Off
CW ----- Off
N. B. ----- Off
SQUELCH ----- Fully counter-clockwise
AF GAIN ----- Medium position
RF GAIN ----- Fully clockwise
VXO ----- Any position

* Note : FT-75B normally supplied with one channel on each band, except 20 meter.

- (2) Push the POWER button to turn on. The panel light over the switch will light, also the panel light over the heater switch will light if the FP-75B is being used.
- (3) If an antenna is connected, a signal may be heard which can be tuned by adjusting the VXO knob. Turning the knob clockwise increases RX frequency similarly turning the knob counter-clockwise decreases the frequency.
- (4) The AF GAIN and RF GAIN should be set for suitable listening level.
- (5) When a weak signal is masked by impulse type noise the noise blanker may be used. Press the N. B. button to turn the noise blanker on. Press again to turn off.
- (6) When listening to a fixed frequency without signals present the SQUELCH may be used to remove the background noise. The further clockwise the control is turned, the stronger a signal will have to be to open the squelch. The point at which the set just goes quiet is the most sensitive.

TRANSMITTER TUNING

SSB

- (1) Plug the microphone into the MIC jack.
- (2) If the DC-75B is being used it will be necessary to press the HEATER switch and wait 30 seconds for heater warm-up. This is not necessary when using the FP-75B because the heaters are turned on when the POWER switch is depressed.
- (3) The FT-75B is pretuned at factory, so all that is required now is to press the P. T. T. button on the microphone and speak. The Mic. Gain is preset and does not need to be changed for each band.

CW

- (1) Plug a key or keyer into the KEY jack at the rear of the FT-75B. (Use two contact plug for key connection.)
- (2) Press the CW switch in to transmit, and repress it to receive.

METER INDICATIONS

The front panel METER indicates in the following three ways:

- (1) When receiving it works as an S-meter. With the RF GAIN at maximum, S-9 represents a signal of 40 dB or 100 uV antenna input.
- (2) On transmit with the METER switch on the rear panel in I. C. position the lower scale on the meter indicates cathode current of the final tubes. On SSB without any Mic input the idle current should be 50 mA. (This is shown as the green line on the meter scale.) With speech the METER should show peaks of approximately 200 mA. On CW I. C. will be 200 mA or more.

- (3) On transmit with the METER switch in the P. O. position the meter indicates relative output power. The P. O. function does not have a scale but serves as indication of relative output for tuning up the transmitter.

NEW CHANNELS INSTALLATION

The FT-75B is normally supplied with one channel installed on 80, 40, 15 and 10m. It is possible to install three crystals on each band, total of 15 crystals.

The frequency of the crystals is calculated as follows:

- (a) 80m and 40m

$$f_x = F + 5127.4 \text{ (SSB)}$$

$$f_x = F + 5173.2 \text{ (CW)}$$

- (b) 20m and 15m

$$f_x = F - 5172.4 \text{ (SSB)}$$

$$f_x = F - 5173.2 \text{ (CW)}$$

- (c) 10m

$$f_x = \frac{F - 5172.4}{2} \text{ (SSB)}$$

$$f_x = \frac{F - 5173.2}{2} \text{ (CW)}$$

where : f_x = crystal frequency KHz
 F = TX/RX carrier frequency KHz

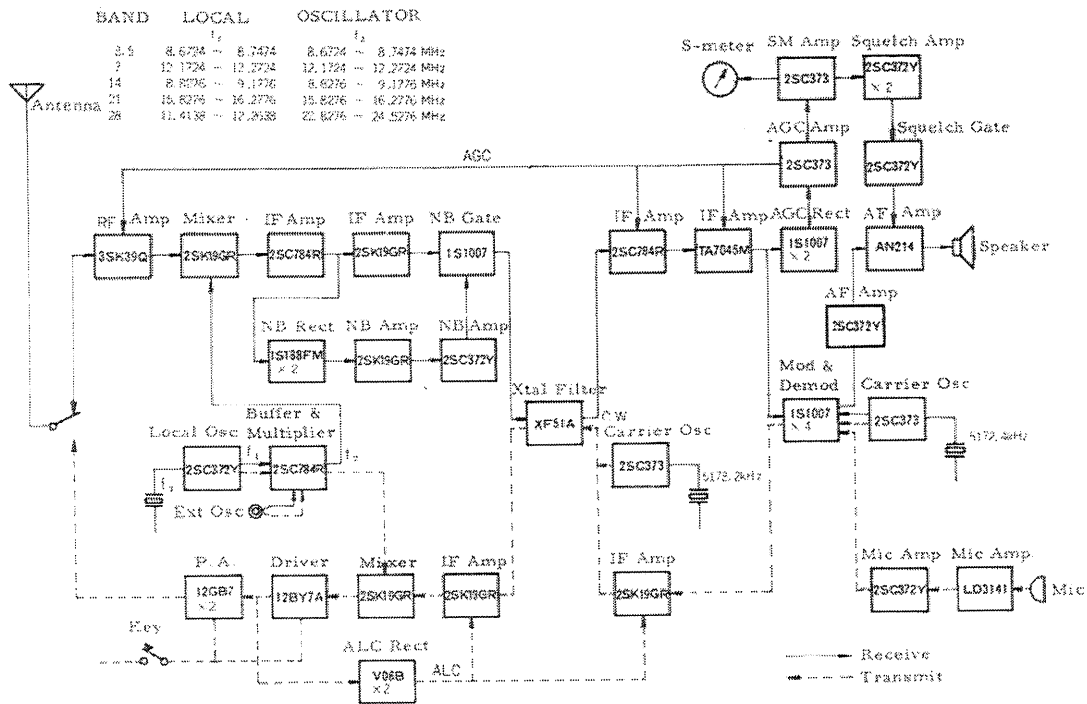
The crystal holder accepts an HC-25/U type crystal. The crystal loading capacitance is 46 pF. New crystals can be ordered from the authorized dealers.

When calculating new crystal frequencies the allowance should be made to the amount of shift available in the VXO so that out of band operation is not possible. This is only necessary if operating close to band edges is contemplated.

CIRCUIT DESCRIPTION

The FT-75B is composed of a 5 MHz I.F. single conversion super heterodyne receiver, and a 5 MHz single conversion transmitter. A variable crystal oscillator (VXO) is used as the local oscillator instead of a VFO. This results in an oscillator with good stability for mobile use.

The FT-75B is all solid-state except for the transmitter driver and final amplifier tubes. An external VXO unit is available for home station use.



BLOCK DIAGRAM

RECEIVER SIGNAL FLOW

The signal from the antenna passes through the antenna relay and IF trap to the antenna coil selected by the BAND switch. The signal from the antenna coil is fed to gate 1 of the RF amplifier Q401, 3SK39Q, which also has A.G.C. applied to gate 2. The output of the RF amplifier is

fed to the mixer Q402, 2SK19GR, where it is mixed with the local oscillator signal to produce an output at the I. F. frequency of 5173.9 KHz. The local oscillator is on the high side of the signal on 80m and 40m and on the low side of the signal on 20, 15 and 10m.

The I. F. signal is amplified by Q301, 2SC784R, and Q302, 2SK19GR, and fed through the Noise Blanker gate-diode D301, 1S1007, to the crystal filter. The crystal filter is common to both TX and RX.

The output signal from the filter is amplified by Q303, 2SC784R, and Q304, TA7045M, and fed to the balanced mixer detector D201 - D204. The 5172.4 KHz crystal oscillator signal is fed to the detector. The audio signal from the detector passes through RL1d and the audio gain potentiometer to the audio amplifier Q101, 2SC372Y, and Q102, AN214. The audio output signal is fed to pin 3 of the power connector and also to pin 2 of the Mic jack for use in the external VOX unit as anti-trip.

AGC

Some of the I. F. output from Q304 is rectified by D302 and D303, the resulting DC voltage is amplified by Q305, 2SC373. The gain of the receiver is controlled by applying the voltage at the collector of Q305 to the gate 2 of Q401, RF AMP, to the base of Q303, IF AMP, and to the bias of Q304.

NOISE BLANKER

The I. F. output from Q301 is rectified by D308 and D309, 1S188FM, and the pulse noise components are amplified by Q307, 2SK19GR. The amplified noise pulses are fed to Q308, 2SC372Y. When noise is present, each noise pulse turns Q208 "ON" and collector voltage drops to a low level. This causes the gate diode D301, 1S1007, which is in the I. F. signal path, to be reverse biased.

This then blocks the noise pulse in the I. F. amplifier before the crystal filter. The noise blanker threshold is controlled by the preset bias on D301 by VR301.

S-METER

The emitter current of the A. G. C. amplifier Q305 is amplified by the S-meter amplifier Q306, 2SC373, and the emitter current of Q306 is fed to the S-meter via D314 and Relay.

SQUELCH

The collector voltage of the S-meter amplifier Q306 is fed to the amplifiers Q312 and Q313 via VR3. These two transistors form a Schmitt trigger circuit to control the squelch switching transistor Q103. Q103 is in parallel with the audio line between the pre-amp and power amplifier sections of Q101. If Q103 is turned "ON", no signal reaches the power amplifier. The threshold of the squelch is set by VR3.

TRANSMITTER SIGNAL FLOW

The signal from the microphone is amplified by the hybrid IC Q201, LD3141, and fed to the emitter follower Q202, 2SC372Y, through Mic gain potentiometer VR201. The output from the emitter follower is fed to the balanced modulator D201 - D204 through RL1d. The 5172.4 KHz carrier signal from Q203, 2SC373, is also fed to the balanced modulator. The double sideband signal from the balanced modulator is amplified by Q309, 2SK19GR, and fed to the crystal filter.

The output of the crystal filter is upper sideband and is amplified by Q310, 2SK19GR. When operating on CW the carrier oscillator Q203 is turned off and the CW carrier oscillator Q311, 2SC373, on 5173.2 KHz is turned on and fed into the source of I. F. amplifier Q309. The signal from Q310 is fed to the TX mixer Q403, 2SK19GR, and the signal from the local oscillator is coupled into the source. The drain circuit is tuned to the desired band as selected by the BAND switch. The SSB input to the mixer is upper sideband but because the local oscillator is on the high side of 5 MHz the heterodyned output of the mixer is LSB on 80m and 40m. On 20m, 15m and 10m the local oscillator is on the low frequency side and the output is USB.

The output of the mixer is amplified by the 12BY7A to a level sufficient to drive the 12GB7. The 12GB7 has a Pi-network tank circuit and is neutralized by TC11 and C18 for stable operation on the high frequency bands.

ALC

The detected RF signal appearing across R5 on the PA grid circuit is coupled through C347 to the voltage doubler rectifier D307 and D306 and then used to control the gain of the I. F. amplifier Q309 and Q310. Thus when the 12GB7 starts to draw grid current, the gain of the I. F. amplifier is reduced to prevent overdrive.

KEY CIRCUIT

When the key is plugged in and open, -80V cutoff bias is applied to the 12BY7A and 12GB7 control grids. When the key is depressed the bias is removed from the 12BY7A which then develops self bias and the bias on the 12GB7 is reduced to the operating level of approximately -45V.

LOCAL OSCILLATOR

The oscillator operates on the fundamental frequency of the mixer input on 80m, 40m, 20m and 15m. On 10m the oscillator operates on half the required injection frequency. The variable capacitor VC1 is connected in series with the crystal selected by the channel switch in order to shift the crystal frequency slightly.

The output of the crystal oscillator is fed to Q405 when the channel switch is in positions 1, 2 or 3 but when in the EXT position the oscillator is turned off and the input to Q405 is connected to the EXT socket on the rear panel. This allows an external VXO or VFO to be fed into Q405.

The transistors Q405, 2SC784R, functions as a buffer stage except when operating on crystal control on 10m where it operates as a frequency doubler. The output of Q405 is connected to the TX mixer Q403, 2SK19GR, and the RX mixer Q402, 2SK19GR.

NOTE : External VFO should be disconnected when operating on the internal VXO to prevent generation of spurious signals.

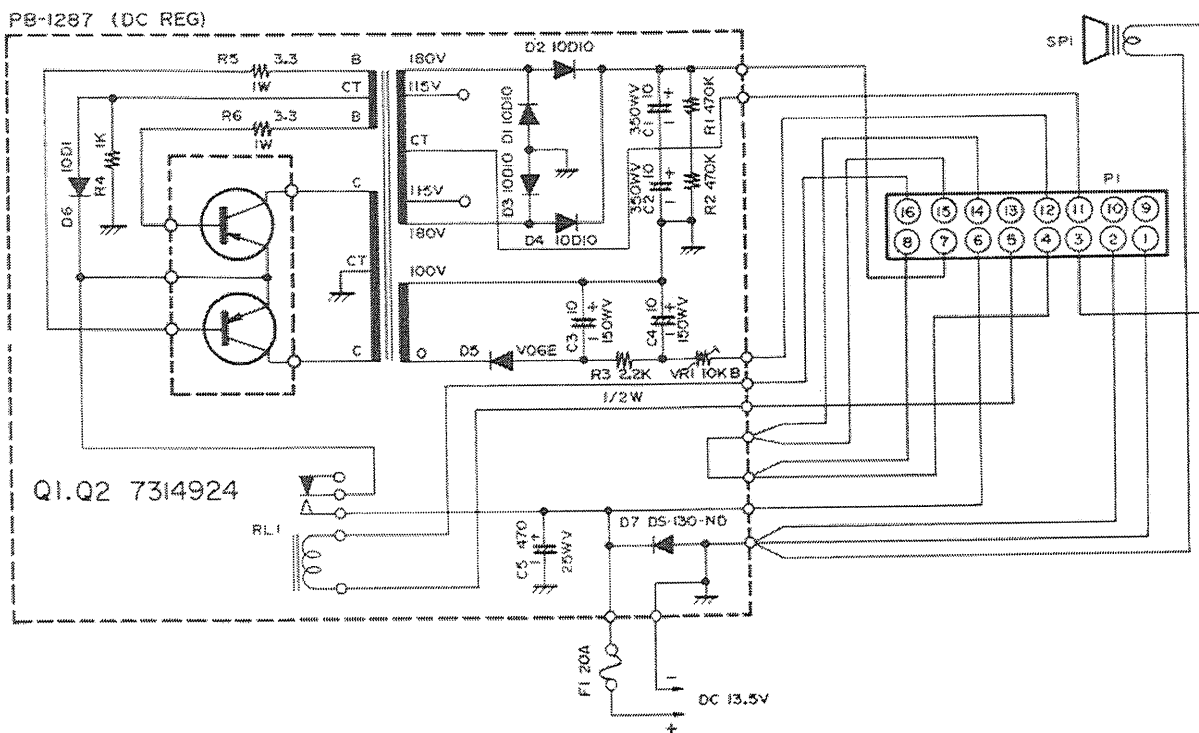
POWER SUPPLIES

DC-75B POWER SUPPLY

The DC-75B is a power supply for 13.5V negative ground DC operation of the FT-75B. It contains a built-in speaker.

When the POWER switch on the FT-75B is depressed, the 13.5V DC is connected to the receiver only. When the HEATER switch is pressed, relay RL1 is activated and this connects 13.5V DC to the heaters and to one side of RL2 coil. When the microphone button is pushed or the CW switch depressed the other side of RL2 coils is earthed causing RL2 to activate and turn the DC-DC convertor on. The transistors Q1 and Q2, 7314924, drive the power transformer T1 at about 5 KHz, to produce voltages for the high voltage and bias of the FT-75B.

This power supply only functions on transmit so as to reduce noise and current drain on receive. The DC-75B is supplied with a mobile mounting bracket. See earlier description for installation.



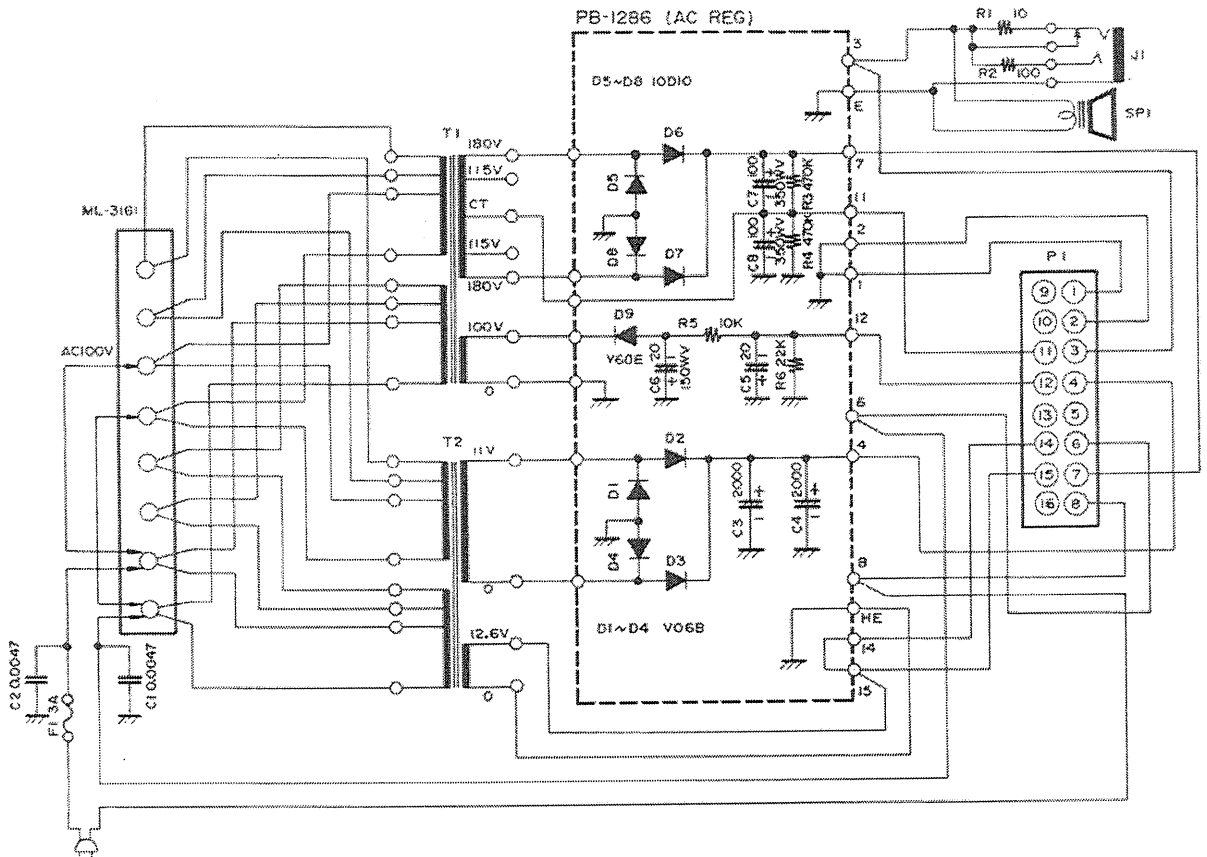
DC-75B SCHEMATIC DIAGRAM

FP-75B POWER SUPPLY

The FP-75B is an AC power supply for use with the FT-75B on 100, 110, 117, 200, 220 or 234V AC. It also has a built-in speaker and is the same physical size as the FT-75B.

When the POWER switch on the FT-75B is depressed, all supply voltages are supplied to the set, and the HEATER switch does not function. Separate windings are used for all supply voltages except the two high voltage supplies.

When a pair of headphones is plugged into the PHONE jack the built-in speaker is disconnected and the headphones are supplied through an attenuator formed by R1 and R2.



FP-75B SCHEMATIC DIAGRAM

ALIGNMENT

ADJUSTMENT OF TUNING COILS

All coils are pre-tuned to the frequencies installed for each channel when shipped from our factory. The 20 meter coils are tuned for use on 14.150 MHz. If additional crystals are installed it may be necessary to realign the coils.

If the crystal frequencies are close to the original frequencies no re-tuning will be required, however when the separation is considerable the coils should be aligned to maintain constant output/receive sensitivity over the operating range, i. e. "stagger tuning". Alternatively an average frequency can be calculated from the following formula and the coils peaked at this frequency:

$$\text{Average Frequency} = \sqrt{\text{Highest Freq.} \times \text{Lowest Freq.}}$$

To adjust oscillator output coils, adjust on 10 meter before aligning other bands, by connecting the RF probe of VTVM to the oscillator test point (see photo) and peak the slug of L403 for maximum. If the voltage is greater than 0.7 volt (0.5V minimum) detune slug to give 0.7 volt. The adjustments are done on one of the fixed channel frequencies.

The above procedure should be repeated for the other bands by adjusting TC501 - 504. The VTVM should show more than 0.6V RMS.

(1) Receiver RF Coils

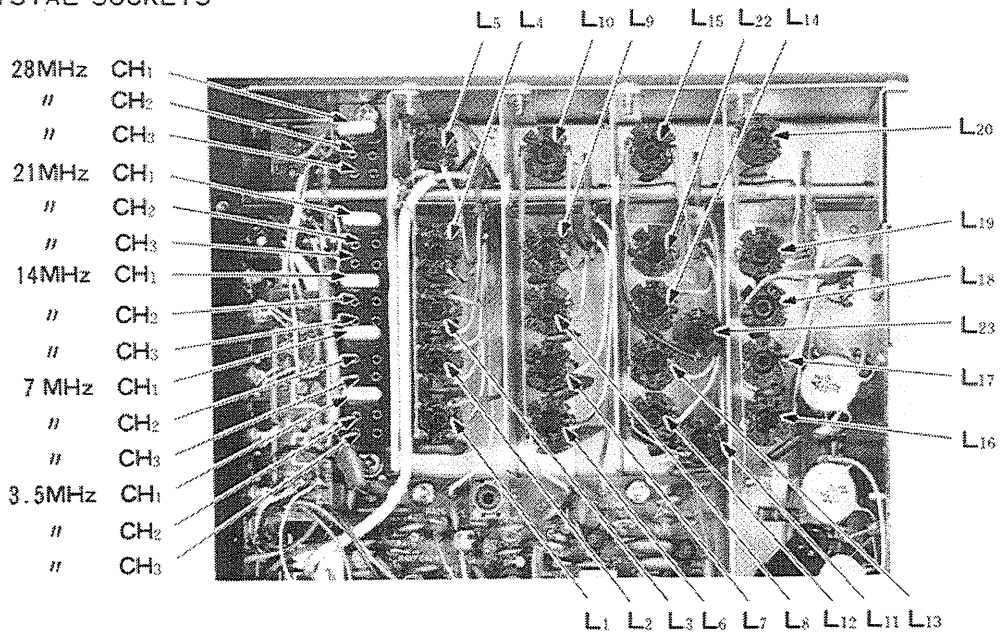
Feed a signal into the receiver at the required frequency and adjust L1 - L10 for maximum S-meter indication for each band.

(2) Transmitter Coils

Connect the FT-75B to a 50 ohm dummy load and feed a low level (no more than 5mV) tone or two tone signal into the Mic. jack pin 6. Adjust the coils for each band according to the chart on next page. Do not drive the transmitter too hard because it may be difficult to find a peak due to P. A. saturation, and also to limit the final amplifier dissipation. Make short tests only. Mic. jack pin 5 is P. T. T. (push to talk) control line.

| BAND | LOCAL OSC. | RX RF | TX RF |
|------|------------|---------|---------------------|
| 80m | TC501 | L1, L6 | L11, L16, TC1, TC6 |
| 40m | TC502 | L2, L7 | L12, L17, TC2, TC7 |
| 20m | TC503 | L3, L8 | L13, L18, TC3, TC8 |
| 15m | TC504 | L4, L9 | L14, L19, TC4, TC9 |
| 10m | L403 | L5, L10 | L15, L20, TC5, TC10 |

CRYSTAL SOCKETS

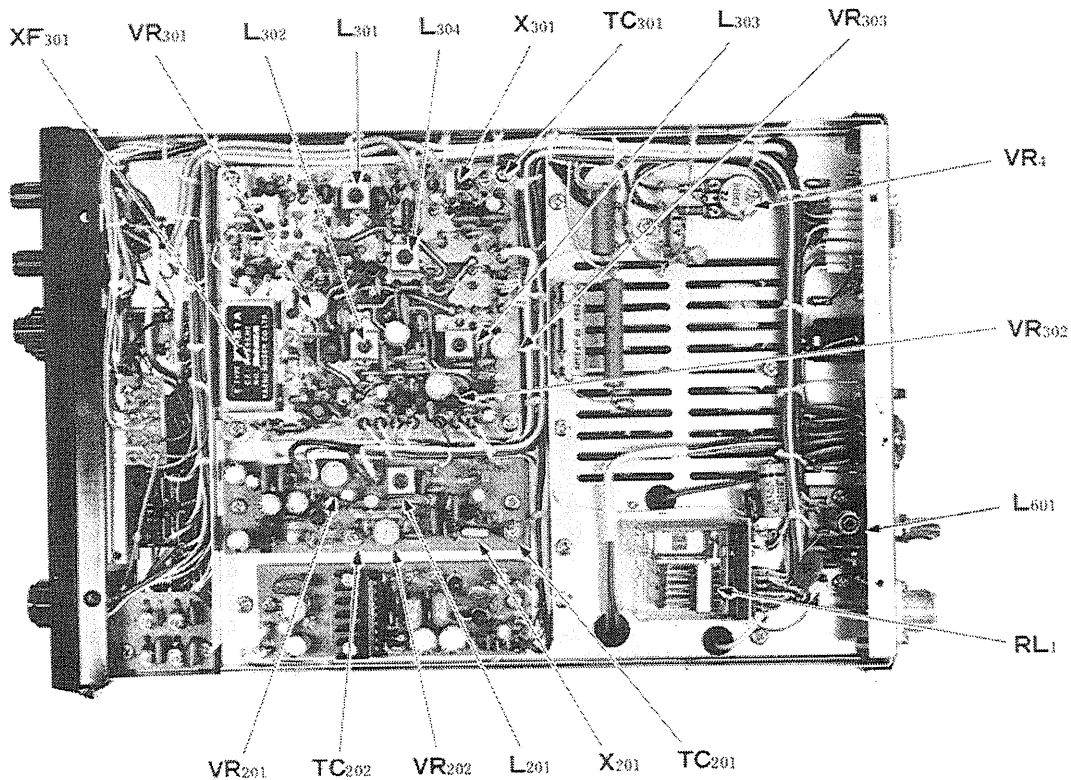


BOTTOM VIEW SHOWING COILS AND CRYSTAL SOCKETS

(3) Trap Coil Adjustment

- L401 and L601 : Feed a signal on 5173 KHz into the antenna connector and adjust the cores of these coils for minimum signal or minimum S-meter reading. The adjustment of L401 will detune L1 - L5 slightly so it may be necessary to re-align these coils.
- L404 : Feed a signal on 5173 KHz into pin 5 of the EXT socket and adjust L404 for minimum S-meter reading.
- L22 and L23 : Using an external receiver, operate the FT-75B transmitter on 21.4 MHz and tune the receiver to the 16.2 MHz spurious signal and adjust L22

for minimum spurious signal strength. Operate the FT-75B on 28.55 MHz and tune the receiver to the 22.4 MHz spurious signal and adjust L23 for minimum spurious signal strength.



BOTTOM VIEW

IF ADJUSTMENT

Receiving any signal peak L402, L301-L303 and L201 for maximum S-meter reading. Peak L304 for maximum transmitter output with tone input to Mic. jack.

NOISE BLANKER THRESHOLD LEVEL

Tune to an S9+ signal, then turn RF gain down until S-meter shows S8. Turn N. B. on and adjust VR301 for S7 meter reading.

S-METER ZERO AND SENSITIVITY ADJUSTMENT

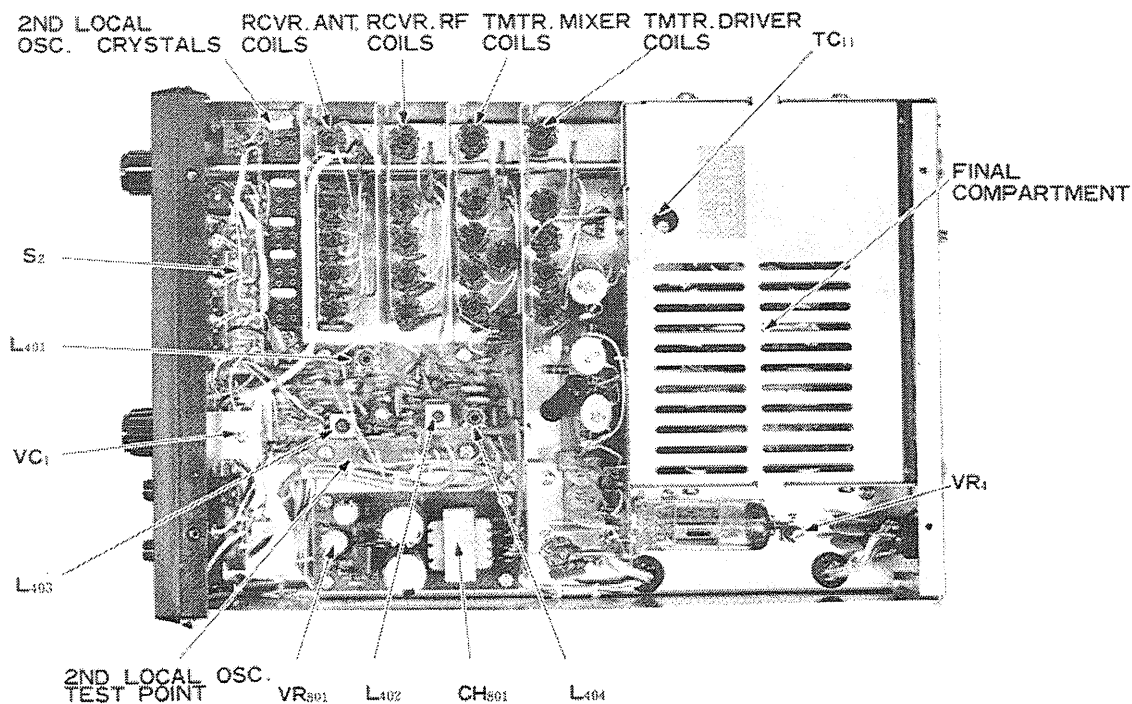
Set RF gain at maximum position, and disconnect antenna or switch to blank channel position (no crystal installed). Adjust VR303 so that the S-meter is just starting to move off the zero mark. Feed a 40 dB signal level into antenna connector and adjust VR302 for S9 scale deflection. It may be necessary to repeat these procedures several times.

BIAS VOLTAGE

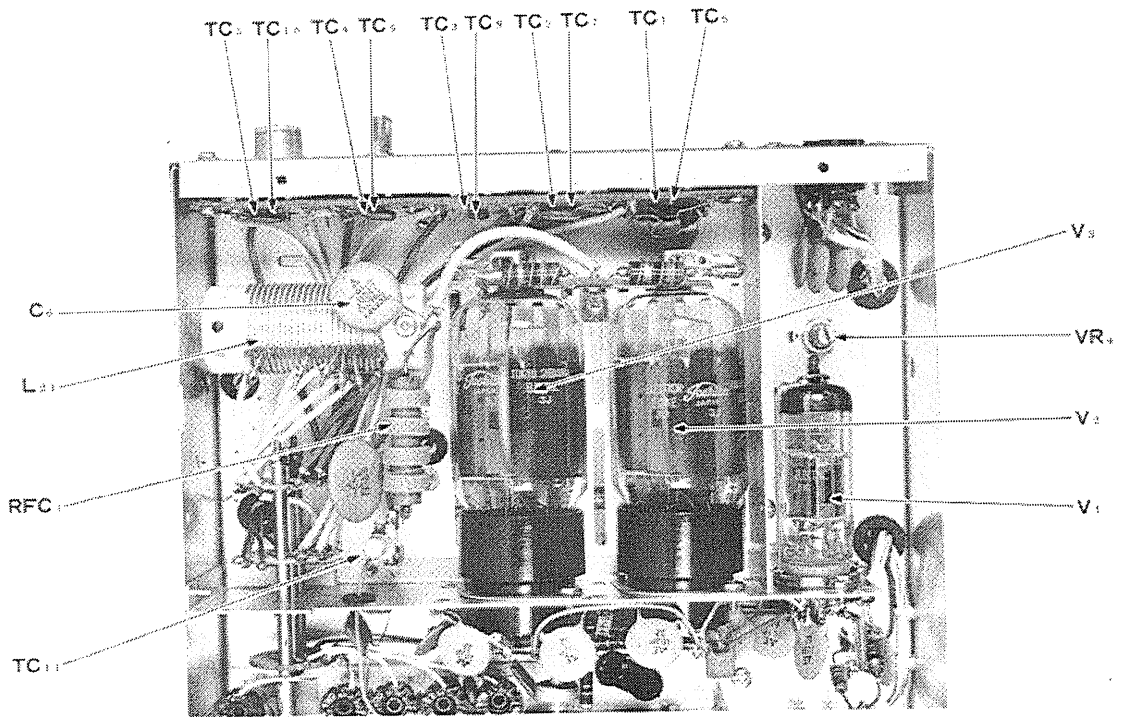
Set FT-75B to transmit with the meter switch on IC position and no microphone input. Adjust VR4 to give 60 mA cathode current. (green line)

NEUTRALIZATION

Connect the FT-75B to a 50 ohm dummy load and set to transmit on 10 meter with low level tone signal fed into Mic. jack pin 6. Adjust the level of tone for approximately 100 mA I. C. With an insulated screw driver, adjust the neutralizing capacitor TC11 so that maximum output of the transmitter corresponds to a dip in plate current when the P. A. plate tuning capacitor TC5 is adjusted to resonance.



TOP VIEW



FINAL AMPLIFIER COMPARTMENT

MAINTENANCE

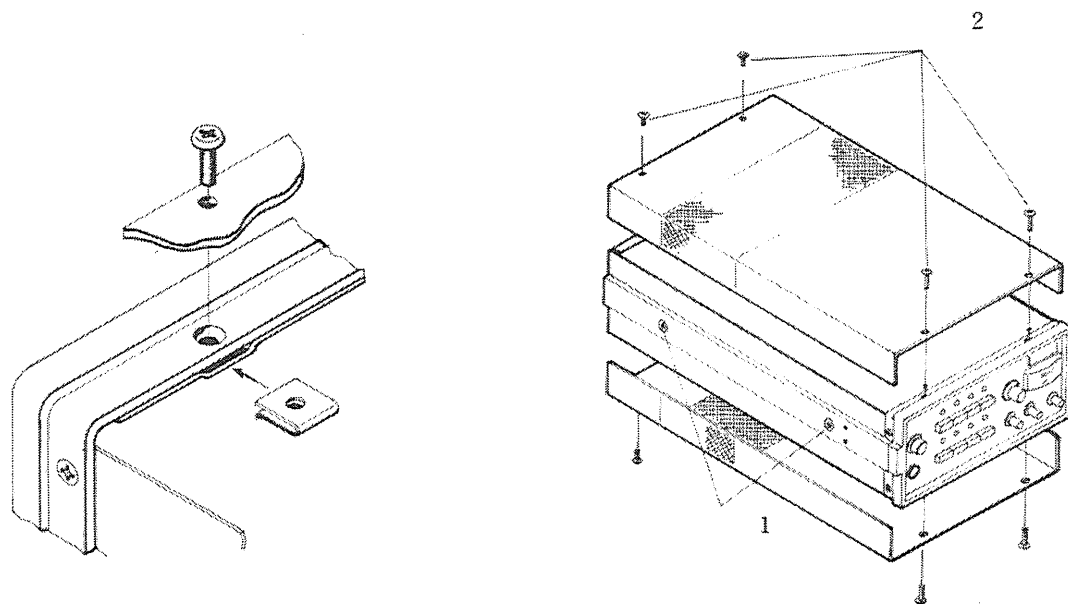
If the FT-75B is used in mobile it is advisable to clean the set occasionally to remove built-up dust. Use vacuum cleaner.

In case of faults developing, first check power supply, antenna and ground connections before assuming fault is in transceiver. Note if fault occurs on transmit or receive, and if on all bands or only one band. Check voltages and resistances according to the charts. When replacing faulty components, especially tubes and transistors, make sure that the same type is used for replacement.

When removing the top and bottom covers of the FT-75B note the following:

1. Loosen the four side screws first. (two on each side)
2. Remove the four screws from each cover. (two short screws at the rear and two long screws at the front)

The following charts give typical ($\pm 10\%$) voltage and resistance measurements on an FT-75B.



VOLTAGE CHART

| No. | E or S | | B or G | | C or D | | No. | E or S | | B or G | | C or D | |
|---------|--------|------|--------|------|--------|------|---------|--------|------|--------|------------------|--------|------|
| | T | R | T | R | T | R | | T | R | T | R | T | R |
| Q 1 0 1 | 0.85 | 0.85 | 1.5 | 1.5 | 5.5 | 5.5 | Q 3 0 9 | 2.0 | 0 | -0.2 | 0 | 10.5 | 0 |
| Q 1 0 3 | 0 | 0 | 0 | 0 | 0.75 | 0.15 | Q 3 1 0 | 0.6 | 0 | -0.2 | 0 | 10.5 | 0 |
| Q 2 0 2 | 6.0 | 6.0 | 6.6 | 6.6 | 12.5 | 12.5 | Q 3 1 1 | 0.25 | 14.5 | -2.0 | 8.5 | 6.0 | 9.0 |
| Q 2 0 3 | 0.3 | 0.3 | -2.1 | -2.1 | 4.5 | 4.5 | Q 3 1 2 | 0 | 0.1 | 0 | 0.7 | 0 | 9.0 |
| Q 3 0 1 | 0 | 0.2 | 0 | 0.2 | 0 | 11.0 | Q 3 1 3 | 0 | 0.1 | 0 | 0.9 | 0.3 | 0.2 |
| Q 3 0 2 | 0 | 1.5 | 0 | 0 | 0 | 11.0 | Q 4 0 1 | 0 | 2.3 | 0 | (1)2.0 (2)2.5 | 0 | 11.0 |
| Q 3 0 3 | 0 | 2.0 | 0 | 2.6 | 0 | 11.0 | Q 4 0 2 | 0 | 1.9 | -0.3 | 0.1 | 0 | 11.0 |
| Q 3 0 5 | 0 | 0.6 | 0.5 | 1.0 | 0 | 6.0 | Q 4 0 3 | 2.5 | 2.5 | 0 | 0 | 9.0 | 9.0 |
| Q 3 0 6 | 0 | 0 | 0 | 0.6 | 0 | 6.0 | Q 4 0 4 | 1.7 | 1.7 | 2.0 | 2.0 | 7.5 | 7.5 |
| Q 3 0 7 | 0 | 1.3 | 0 | 0 | 0 | 11.0 | Q 4 0 5 | 1.1 | 1.1 | -0.4 | -0.4 | 13.0 | 13.0 |
| Q 3 0 8 | 0 | 2.0 | 0 | 2.5 | 0 | 4.3 | Q 8 0 1 | 9.0 | 9.0 | 9.6 | 9.6 | 14.5 | 14.5 |
| | | | | | | | Q 8 0 2 | 6.0 | 6.0 | 6.6 | 6.6 | 9.6 | 9.6 |

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------|---|-----|-----|-----|------|-------------|------------|-------------|------|--------------|
| Q 1 0 2 | T | 6.5 | 0 | 8.0 | 11.0 | 6.0 | 0 | 6.0 | 13.0 | 14.5 |
| | R | 6.5 | 0 | 8.0 | 11.0 | 6.0 | 0 | 6.0 | 13.0 | 14.5 |
| Q 2 0 1 | T | 1.2 | 0.7 | 0 | 0 | 1.35 | 5.0 | 5.0 | 12.5 | 12.5 |
| | R | 1.2 | 0.7 | 0 | 0 | 1.35 | 5.0 | 5.0 | 12.5 | 12.5 |
| Q 3 0 4 | T | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | R | 0.4 | 2.1 | 0 | 1.4 | 7.0 | 10.5 | 6.0 | 0.4 | |
| V 1 | T | 2.6 | 0 | 0 | 0 | A C 12.0 | A C 6.0 | 230 | 150 | 0 |
| | R | 0 | -90 | 0 | 0 | A C 12.0 | A C 6.0 | 260 | 240 | 0 |
| V 2 | T | -40 | 0 | 220 | 150 | -40 | 0 | A C 12.0 | 0.15 | Plate 410 |
| | R | -90 | 0 | 0 | 260 | -90 | 0 | A C 12.0 | 0 | Plate 500 |
| V 3 | T | -40 | 0 | -40 | 150 | -40 | -40 | A C 12.0 | 0.15 | Plate 410 |
| | R | -90 | 0 | -90 | 230 | -90 | -90 | A C 12.0 | 0 | Plate 500 |

- Notes: 1) Values are in VOLTS and are measured by VTVM.
 2) Values in the column "T" are measured in transmit mode and in the column "R" are measured in receive mode connected with FP-75B.
 3) Values are measured at AF and RF gain controls fully clockwise and SQUELCH control fully counter-clockwise.
 4) E: emitter, B: base, C: collector, S: source, G: gate, D: drain, (1): No. 1 gate, (2): No. 2 gate.

RESISTANCE CHART

| No. | E or S | B or G | C or D | No. | E or S | B or G | C or D |
|-------|--------|--------|--------|-------|---------------|---------------------|--------|
| Q 101 | 560 | 1.5K | 5.8K | Q 310 | 180 | 1.1K | 280 |
| Q 103 | 0 | 900 | 7.5K | Q 311 | More than 10M | 2.2K | 1.7K |
| Q 202 | 470 | 1K | 110 | Q 312 | 22 | 1K | 2K |
| Q 203 | 9 | 900 | 1.8K | Q 313 | 22 | 900 | 1.8K |
| Q 301 | 470 | 1.2K | 160 | Q 401 | 200 | (1) 115K (2) 40K | 170 |
| Q 302 | 250 | 1.1K | 150 | Q 402 | 180 | 1K | 150 |
| Q 303 | 1K | 1.3K | 160 | Q 403 | 200 | 1K | 100 |
| Q 305 | 1.5K | 10k | 2K | Q 404 | 100 | 1K | 1.8K |
| Q 306 | 250 | 1.5K | 3K | Q 405 | 150 | 1.2K | 110 |
| Q 307 | 220 | 1K | 140 | Q 801 | 1.5K | 110 | 300 |
| Q 308 | 570K | 1K | 1.3K | Q 802 | 2.1K | 1.5K | 110 |
| Q 309 | 430 | 1.4K | 380 | | | | |

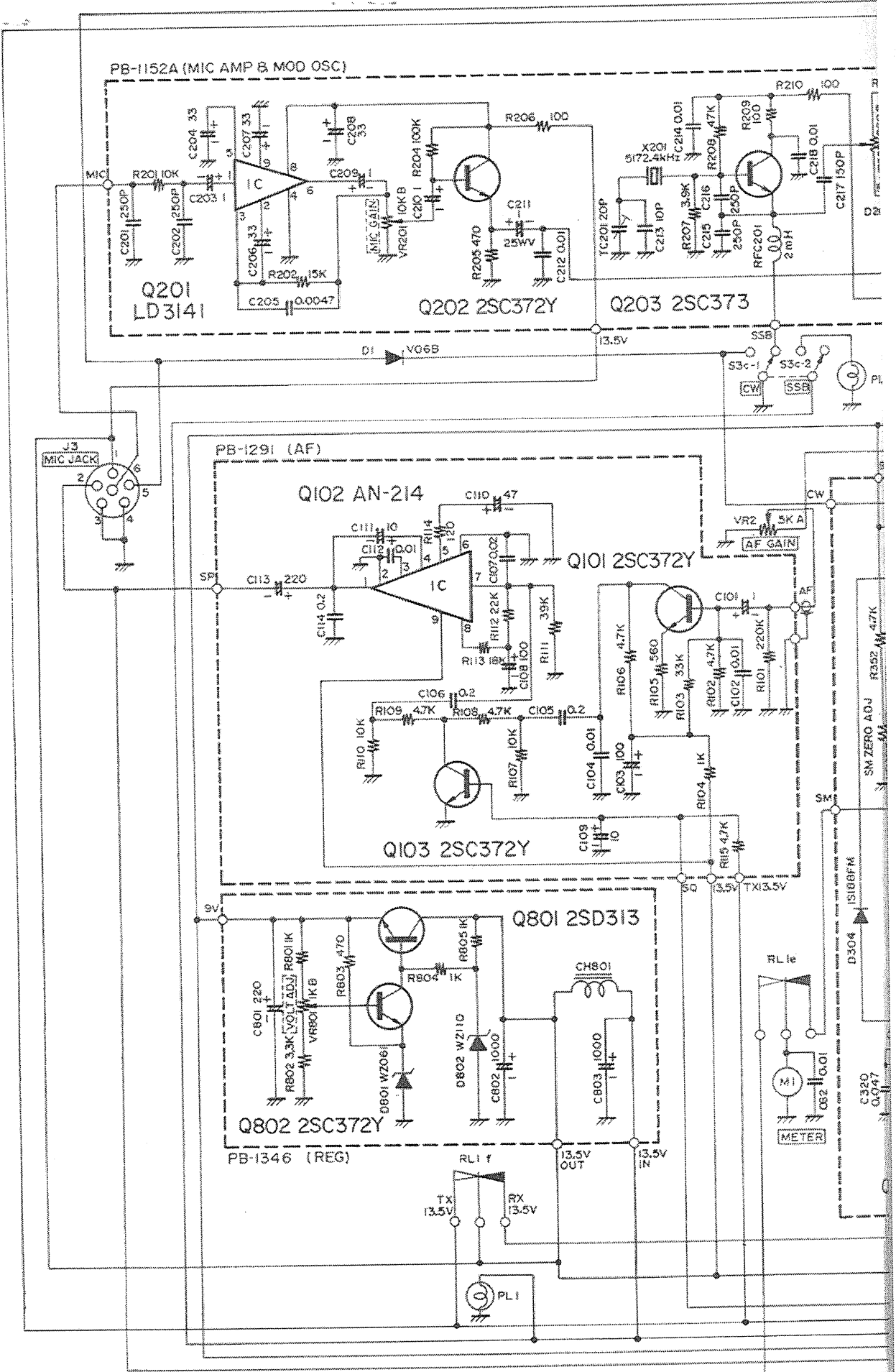
| PIN No. No. | PIN No. | | | | | | | | |
|----------------|---------|------|------|------|------|------|------|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Q 102 | 1.1K | 0 | 1.1K | 2.8K | 1.1K | 0 | 1.9K | 78K | 26 |
| Q 201 | 11K | 2.5K | 150 | 0 | 380 | 2.3K | 2.3K | 110 | 650 |
| Q 304 | ∞ | 1.2K | 0 | 480 | 730 | 140 | 2K | ∞ | |
| V 1 | 100 | 100K | 0 | 0 | 0 | 0 | 22K | 18K | 0 |
| V 2 | 45K | 0 | ∞ | 24K | 45K | ∞ | 0 | 0 | |
| V 3 | 43K | 0 | 26K | 24K | 45K | 45K | 0 | 0 | |

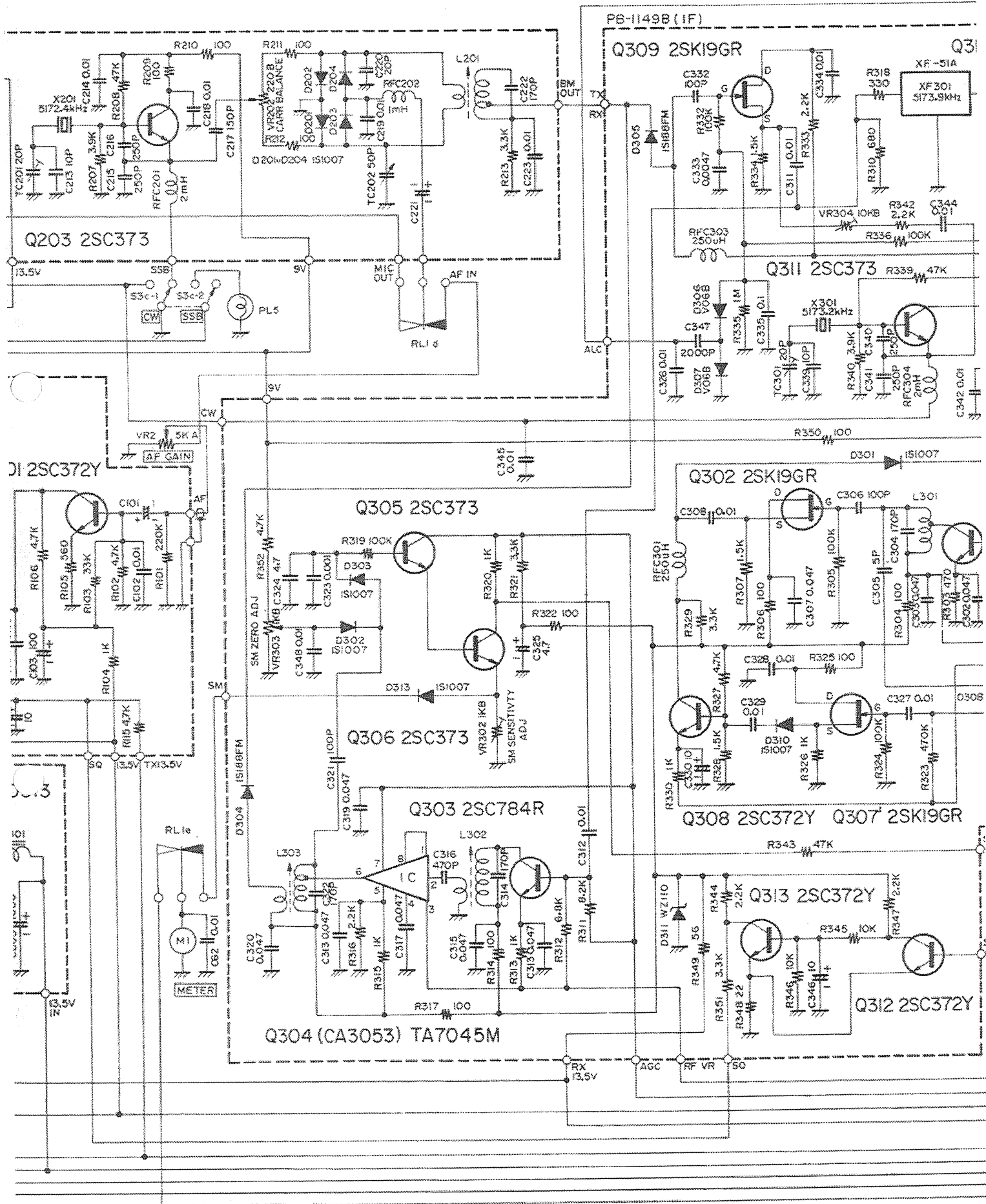
- Notes:
- 1) Values are in OHMS and are measured by VTVM.
 - 2) Values are measured at AF and RF gain controls fully clockwise and SQUELCH control fully counter-clockwise.
 - 3) FP-25B is connected and POWER switch is in OFF position.
 - 4) E: emitter, B: base, C: collector, S: source, G: gate, D: drain, (1): No. 1 gate, (2): No. 2 gate.

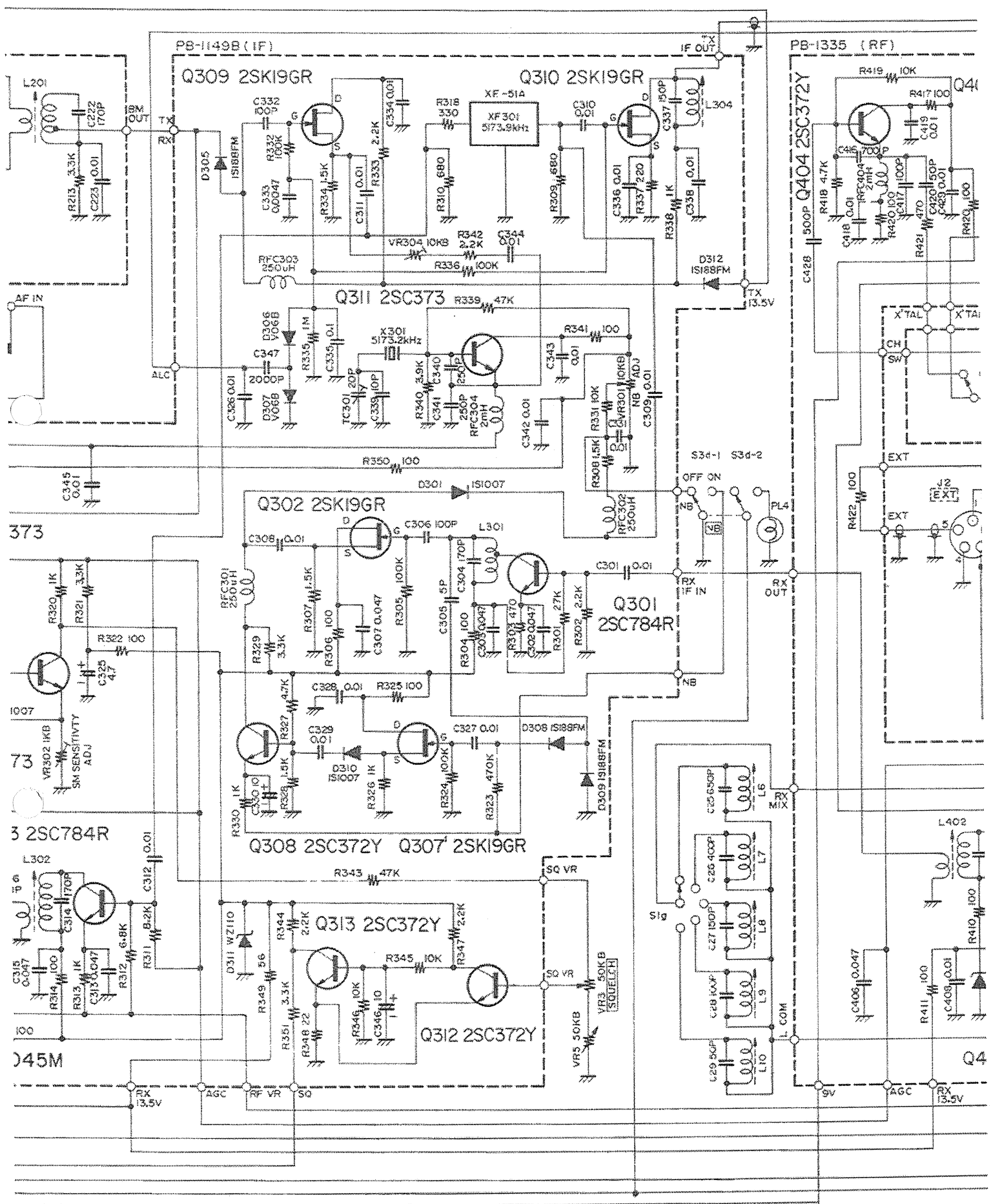
PARTS LIST

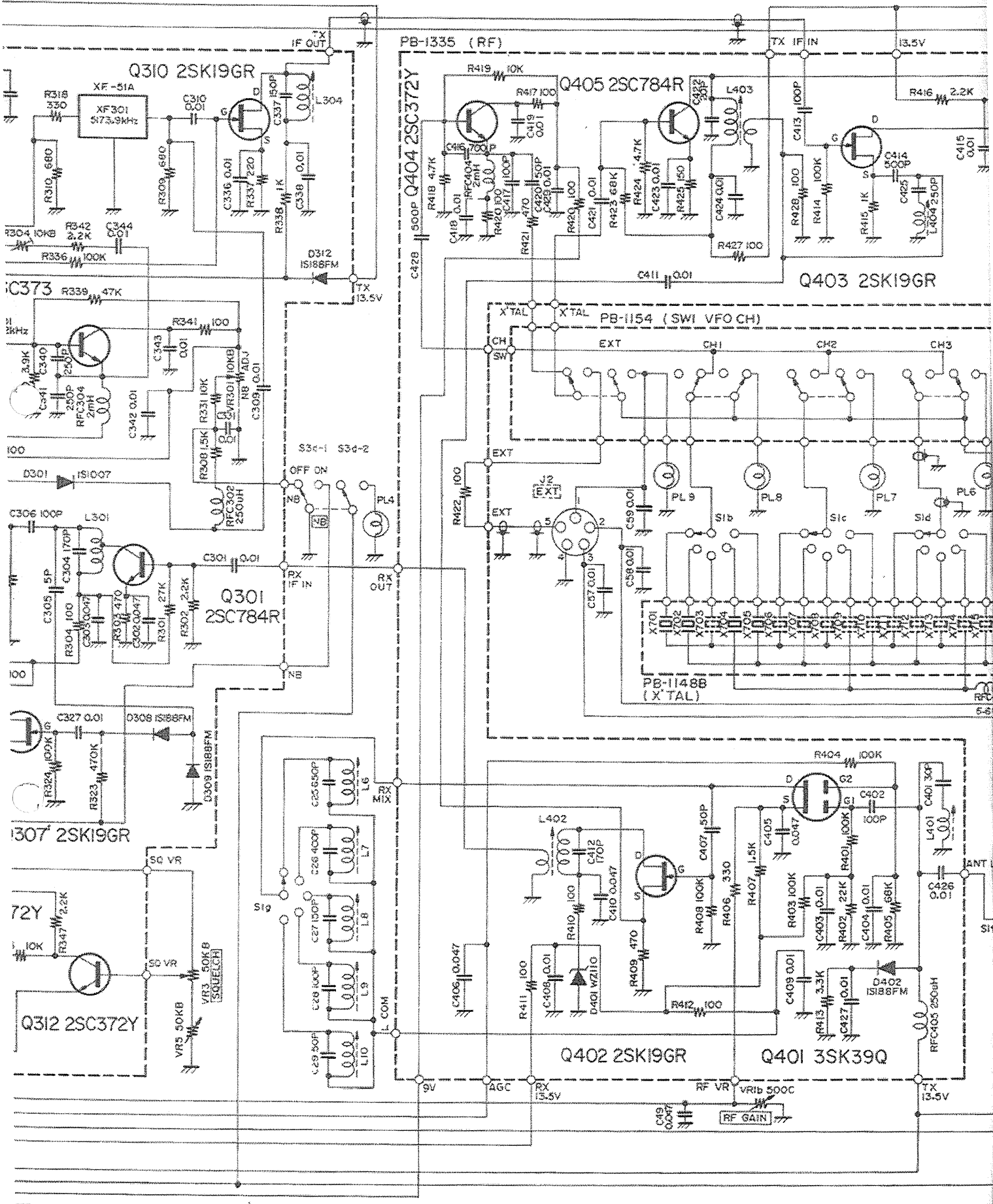
| C-CAPACITOR | | | | 9, 10 | B-2PY | 100PF | max |
|------------------------|--------|----------|-----------------|--------------------------|------------------|-------|------|
| DIPPED MICA | | | | 1, 2 | A-4P3 | 300PF | max |
| 1, 56, 66, 305 | 500WV | 5PF | ±0.5PF | 6-8 | B-7P | 420PF | max |
| 44 | 500WV | 6PF | ±0.5PF | TEFLON | | | |
| 39, 213, 339, 504 | 500WV | 10PF | ±10% | 11 | ECVITY 10×14 | 10PF | max |
| 33, 34, 38, 220, | | | | CERAMIC | | | |
| 422 | 500WV | 20PF | ±10% | 201, 301 | ECV-1ZW | 20PF | max |
| 401, 603 | 500WV | 30PF | ±10% | 202, 501-504 | ECV-1ZW | 50PF | max |
| 24, 29, 407, 420 | 500WV | 50PF | ±10% | VC-VARIABLE CAPACITOR | | | |
| 2 | 500WV | 60PF | ±10% | 1 (VXO) | ECV-3EW | | |
| 32, 37, 502 | 500WV | 80PF | ±10% | R-RESISTOR | | | |
| 3, 11, 14, 19, 23, 28, | | | | CARBON FILM | | | |
| 64, 306, 321, 332, | | | | 348 | ¼W | 22Ω | ±10% |
| 402, 413, 417, 604 | 500WV | 100PF | ±10% | 349 | ¼W | 56Ω | ±10% |
| 22, 27, 217, 337 | 500WV | 150PF | ±10% | 206, 209-212, 314, | | | |
| 222, 304, 314, 322, | | | | 317, 322, 325, 341, | | | |
| 412 | 500WV | 170PF | ±10% | 350, 410-412, 417 | | | |
| 31, 36, 501, 503 | 500WV | 200PF | ±10% | 420, 422, 426-428 | ¼W | 100Ω | ±10% |
| 201, 202, 215, 216, | | | | 114 | ¼W | 120Ω | ±10% |
| 340, 341, 425 | 500WV | 250PF | ±10% | 425 | ¼W | 150Ω | ±10% |
| 18 | 500WV | 280PF | ±10% | 337 | ¼W | 220Ω | ±10% |
| 30, 35 | 500WV | 360PF | ±10% | 406, 318 | ¼W | 330Ω | ±10% |
| 21, 26 | 500WV | 400PF | ±10% | 205, 303, 409, 421, | | | |
| 316 | 500WV | 470PF | ±10% | 803 | ¼W | 470Ω | ±10% |
| 4, 414, 428 | 500WV | 500PF | ±10% | 309, 310 | ¼W | 680Ω | ±10% |
| 20, 25 | 500WV | 650PF | ±10% | 104, 313, 320, 326, | | | |
| 416 | 500WV | 700PF | ±10% | 801, 804, 805 | | | |
| 5, 601, 602 | 500WV | 1000PF | ±10% | 307, 308, 328, 334, | ¼W | 1KΩ | ±10% |
| 347 | 500WV | 2000PF | ±10% | 407 | ¼W | 1.5KΩ | ±10% |
| CERAMIC DISC | | | | 302, 316, 333, 342, | | | |
| 323 | 50WV | 0.001μF | +80 0 % | 344, 347, | ¼W | 2.2KΩ | ±10% |
| 333 | 50WV | 0.0047μF | +80 0 % | 213, 321, 329, 351, | | | |
| 60, 62, 102, 212, | | | | 413, 601, 802 | | | |
| 214, 218, 219, 223 | | | | 207, 340 | ¼W | 3.3KΩ | ±10% |
| 301, 308-312, 327-329 | | | | 102, 106, 108, 109, | | | |
| 331, 334, 336, 338, | | | | 115, 327, 352, 418 | | | |
| 342-345, 348, 403, | | | | 424 | ¼W | 4.7KΩ | ±10% |
| 404, 408, 409, 411 | | | | 312 | ¼W | 6.8KΩ | ±10% |
| 415, 418, 419, 421 | | | | 311 | ¼W | 8.2KΩ | ±10% |
| 423, 424, 426, 427, | | | | 107, 110, 201, 331, | | | |
| 429, 605 | 50WV | 0.01μF | -80 0 % | 345, 346, 419 | ¼W | 10KΩ | ±10% |
| 49, 302, 303, 307 | | | | 202 | ¼W | 15KΩ | ±10% |
| 313, 315, 317-320, | | | | 113 | ¼W | 18KΩ | ±10% |
| 405, 406, 410 | 50WV | 0.047μF | +80 0 % | 112, 402 | ¼W | 22KΩ | ±10% |
| 8-10, 12, 13, 15-17, | | | | 301 | ¼W | 27KΩ | ±10% |
| 40-43, 50-55, | | | | 103 | ¼W | 33KΩ | ±10% |
| 57-59, 61, 326 | 500WV | 0.01μF | +100 0 % | 111 | ¼W | 39KΩ | ±10% |
| 63 | 1KV | 150PF | -100 0 % | 208, 339, 343 | | | |
| 6 | 1.4KV | 0.0047μF | -100 0 % | 405, 423 | ¼W | 47KΩ | ±10% |
| 7 | 1.4KV | 0.01μF | +100 0 % | 204, 305, 319, 324, 332, | | | |
| MYLAR FILM | | | | 336, 401, 403, 404 | | | |
| 205 | 50WV | 0.0047μF | +20% | 408, 414 | ¼W | 100KΩ | ±10% |
| 104, 112 | 50WV | 0.01μF | +20% | 101 | ¼W | 220KΩ | ±10% |
| 107 | 50WV | 0.02μF | +20% | 324 | ¼W | 470KΩ | ±10% |
| 45, 335 | 50WV | 0.1μF | +20% | 335 | ¼W | 1MΩ | ±10% |
| 105, 106, 114 | 50WV | 0.22μF | +20% | CARRON COMPOSITION | | | |
| TANTALUM | | | | 3, 9, 11 | ½W | 56Ω | ±10% |
| 324 | 16WV | 4.7μF | +20% | 8 | ½W | 100Ω | ±10% |
| 211 | 25WV | 1μF | +20% | 5 | ½W | 1KΩ | ±10% |
| ELECTROLYTIC | | | | 10 | ½W | 2.2KΩ | ±10% |
| 101, 203, 209, 210, | | | | 1, 2 | ½W | 4.7KΩ | ±10% |
| 211 | 16WV | 1μF | -50 10 % | 4 | ½W | 10KΩ | ±10% |
| 46, 113, 801 | 16WV | 220μF | -50 10 % | 7 | ½W | 47KΩ | ±10% |
| 103, 108 | 16WV | 100μF | -50 10 % | 12, 13 | | | |
| 802, 803 | 16WV | 1000μF | -50 10 % | 1W | | | |
| 48 | 160WV | 1μF | -100 10 % | METALIC FILM | | | |
| 66 | 250WV | 10μF | -100 10 % | 6 | 3W | 5.1KΩ | ±10% |
| TC-TRIMMER CAPACITOR | | | | 15 | 5W | 18KΩ | ±10% |
| MICA | | | | WIRE WOUND | | | |
| 3-5, | A-1P3Y | 80PF | max | 14 | METER SHONT 0.7Ω | | |

| VR-VARIABLE RESISTOR | | | FIELD EFFECT T.R. | |
|--------------------------|----------------------|-------------|-----------------------|----------------------------|
| 1 (R.F.GAIN,ATT) | PR162G | 500ΩB/500ΩC | 302, 307, 309, 310, | |
| 2 (A.F.GAIN) | PR16 | 5KΩA | 402, 403 | 2SK19GR |
| 3 (SQUELCH) | PR16 | 50KΩB | 401 | 3SK39Q |
| 4 (BIAS) | PR16 | 20KΩB | | INTEGRATED CIRCUIT |
| 5 | EVLSOAAQOB54 | 50KΩB | 102 | AN214 |
| 202 | SR19R | 220ΩB | 304 | TM7045M (CA3053) |
| 302, 303, 801 | SR19R | 1KΩB | 201 | LD314I |
| 201, 301 | SR19R | 10KΩB | | D-DIODE |
| 601 | VR101KR | 5KΩB | | GERMANIUM |
| 304 | VR101KR | 10KΩB | 201 - 204, 301 - 303, | |
| | | | 310, 313 | 1S1007 |
| | | | 304, 305, 308, 309, | |
| | | | 312, 402, 601 | 1S188FM |
| L-INDUCTOR & TRANSFORMER | | | | |
| 1 | RCVR ANTENNA COIL | 3.5MHz | | SILICON |
| 2 | | 7 MHz | | VO6B |
| 3 | | 14 MHz | 1, 2, 306, 307 | ZENER |
| 4 | | 21 MHz | | WZ061 |
| 5 | | 28 MHz | 801 | WZ110 |
| 6 | RCVR. R.F. COIL | 3.5MHz | 311, 411, 802 | |
| 7 | | 7 MHz | | J-JACK & SOKET |
| 8 | | 14 MHz | | 1 (POWER) |
| 9 | | 21 MHz | | MC16SM 16P |
| 10 | | 28 MHz | | 2 (EXT) |
| 11 | TMTR MIXER COIL | 3.5MHz | | S1-6403 5P |
| 12 | | 7 MHz | | 3 (MIC) |
| 13 | | 14 MHz | | FM-146J 6P |
| 14 | | 21 MHz | | 4 (KEY) |
| 15 | | 28 MHz | | SG-7615 2P |
| 16 | TMTR DRIVER COIL | 3.5MHz | | 5 (ANT) |
| 17 | | 7 MHz | | J50-239 |
| 18 | | 14 MHz | | 6 (REMOTE) |
| 19 | | 21 MHz | | SB-0822 7P |
| 20 | | 28 MHz | | TRANSISTOR SOKET SS-104-00 |
| 21 | TANK COIL | | | CRYSTAL SOKET 3P |
| 22 | TRAP COIL | | | CRYSTAL SOKET 12P |
| 23 | TRAP COIL | | | M-METER |
| 201 | B.M.TRANS | | | B-36 |
| 301 - 303, 402 | I.F. TRANS. KAC6400A | | | PB-PRINTED CIRCUIT BOARD |
| 304 | I.F. TRANS | | | PB-1147B |
| 401 | TRAP COIL | | | TRIMMER(LOCAL OSC) |
| 403 | LOCAL COIL | | | PB-1148B |
| 404 | TRAP COIL | | | LOCAL CRYSTAL |
| 601 | TRAP COIL | | | PB-1149B |
| | | | | I.F.UNIT |
| | | | | PB-1152B |
| | | | | MICAMP.CARR OSC & B.M.UNIT |
| | | | | PB-1154 |
| | | | | CHANNEL SELECTOR |
| | | | | PB-1155C |
| | | | | FUNCTION SWITCH |
| | | | | PB-1282 |
| | | | | PLATE. CAP. CRANP |
| | | | | PB-1291 |
| | | | | A.F. AMP |
| | | | | PB-1162 |
| | | | | ANT. TRAP |
| | | | | PB-1334 |
| | | | | TRIMMER |
| | | | | (PLATE & LOAD TUNE) |
| RFC-R.F. CHOKE COIL | | | | |
| 301 - 303, 405 | MICRO INDUCTOR | 250μH | | PB-1335 |
| 202 | | 1mH | | R.F. UNIT |
| 201, 304, 404 | | 2mH | | PB-1346 |
| 9 | | 4mH | | REG. UNIT |
| 4, 5, 7 | P.S. ½W 56Ω 0.5φ | 4.5TS | | RL-RELAY |
| 2, 3 | P.S. 1W 56Ω 1.0φ | 4.5TS | | 1 |
| 403 | R.F. CHOKE (VXO) | 5.6μH | | S-SWITCH |
| 402 | | 6.8μH | | 1 |
| 401 | | 15μH | | BAND SELECTOR 8-13-15 |
| 6, 8 | R.F. CHOKE TV-245 | 250μH | | 2 |
| 1 | R.F. CHOKE (PLATE) | 300μH | | 3 |
| | | | | CHANNEL SELECTOR |
| | | | | FUNCTION SELECTOR |
| | | | | FUNCTION SWITCH |
| | | | | PL-PILOT LAMP |
| | | | | 1-9 |
| | | | | 14V 40mA |
| CH-A.F. CHOKE COIL | | | | |
| 801 | | 15mH 0.4A | | XF-CRYSTAL FILTER |
| | | | | XF-51A 5173.9KHz |
| V-VACUUM TUBE | | | | |
| 1 | 12BY7A | | 201 | SSB CARRIER |
| 2, 3 | 12GB7 | | 301 | CW CARRIER |
| | | | 701 | LOCAL OSC |
| | | | 702 | HC-25/U (3.565KHz) |
| | | | 704 | HC-25/U (7.085KHz) |
| | | | 705 | HC-25/U (21.400KHz) |
| | | | 706, 711 | HC-25/U (28.550KHz) |
| | | | 707, 712 | 3.5MHz (OPTION) |
| | | | 703, 708, 713 | 7MHz (OPTION) |
| | | | 709, 714 | 14MHz (OPTION) |
| | | | 710, 715 | 21MHz (OPTION) |
| | | | | 28MHz (OPTION) |
| Q-IC FET & TR | | | | |
| TRANSISTOR | | | | |
| 101, 103, 202, 308 | | | | |
| 312, 313, 404, 802 | 2SC372Y | | | |
| 203, 305, 306, 311 | 2SC373 | | | |
| 301, 303, 405 | 2SC784R | | | |
| 801 | 2SD313 | | | |









Q310 2SK19GR

PB-1335 (RF)

Q404 2SC372Y

Q405 2SC784R

Q403 2SK19GR

Q301 2SC784R

Q307 2SK19GR

Q312 2SC372Y

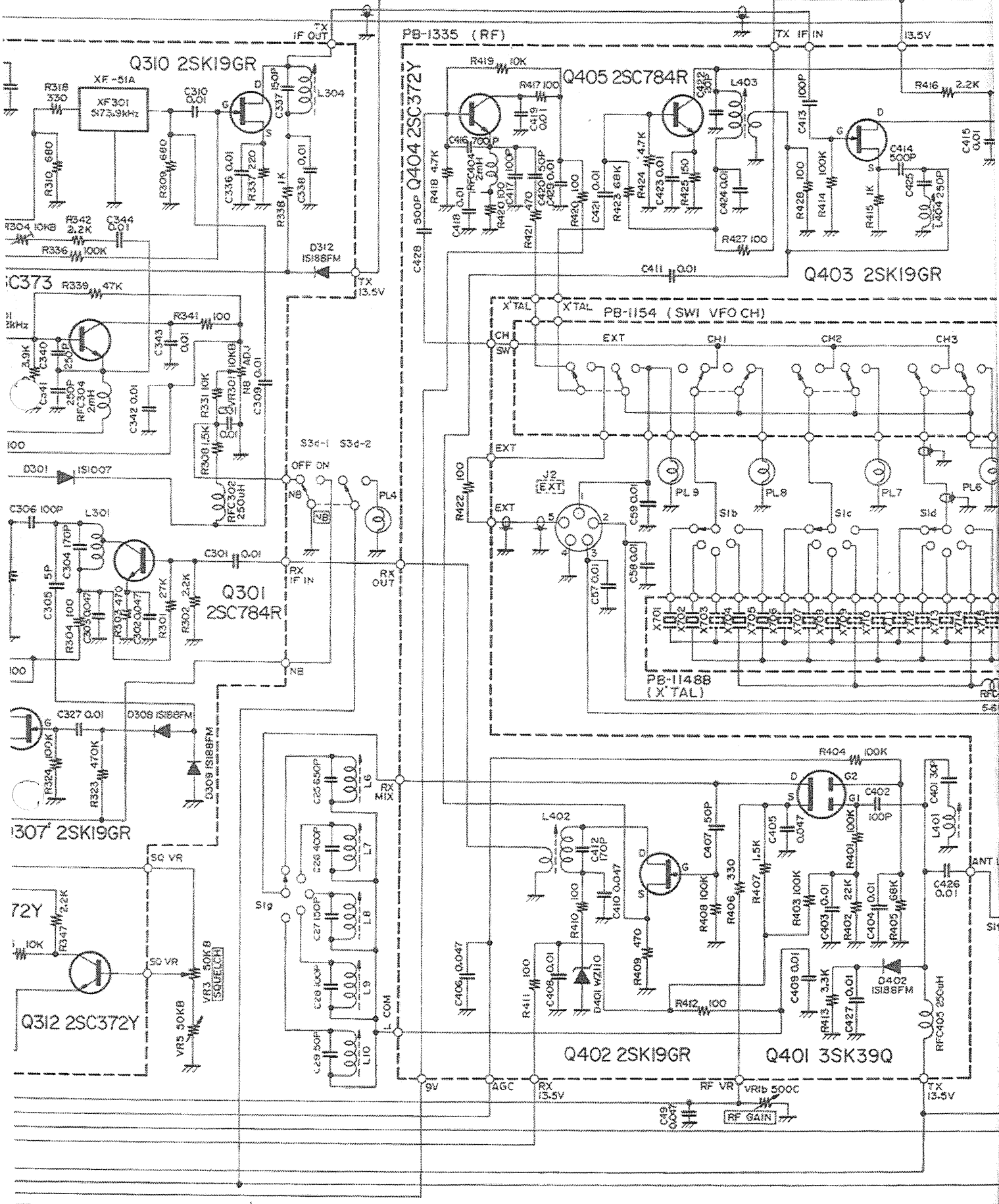
Q402 2SK19GR

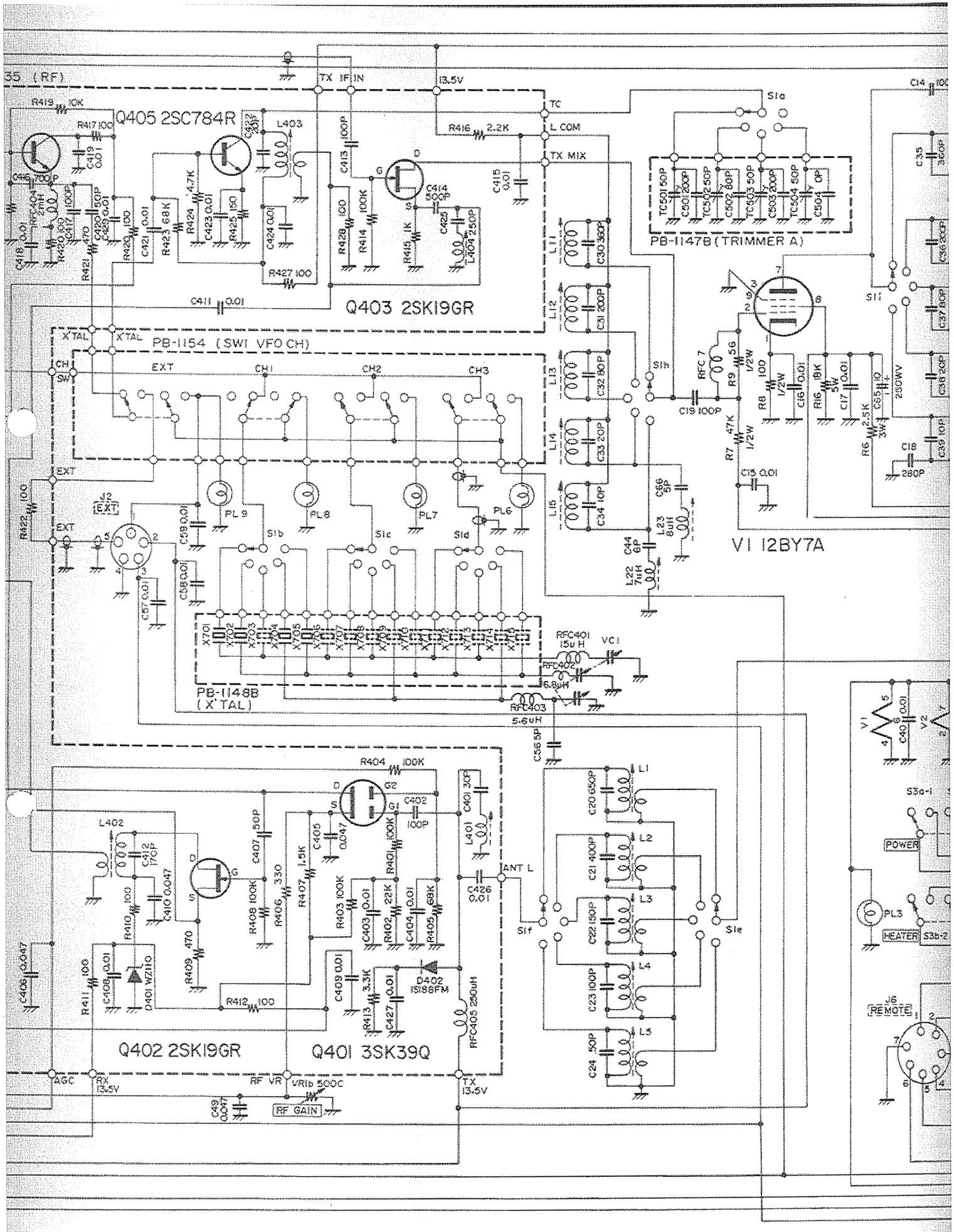
Q401 3SK390

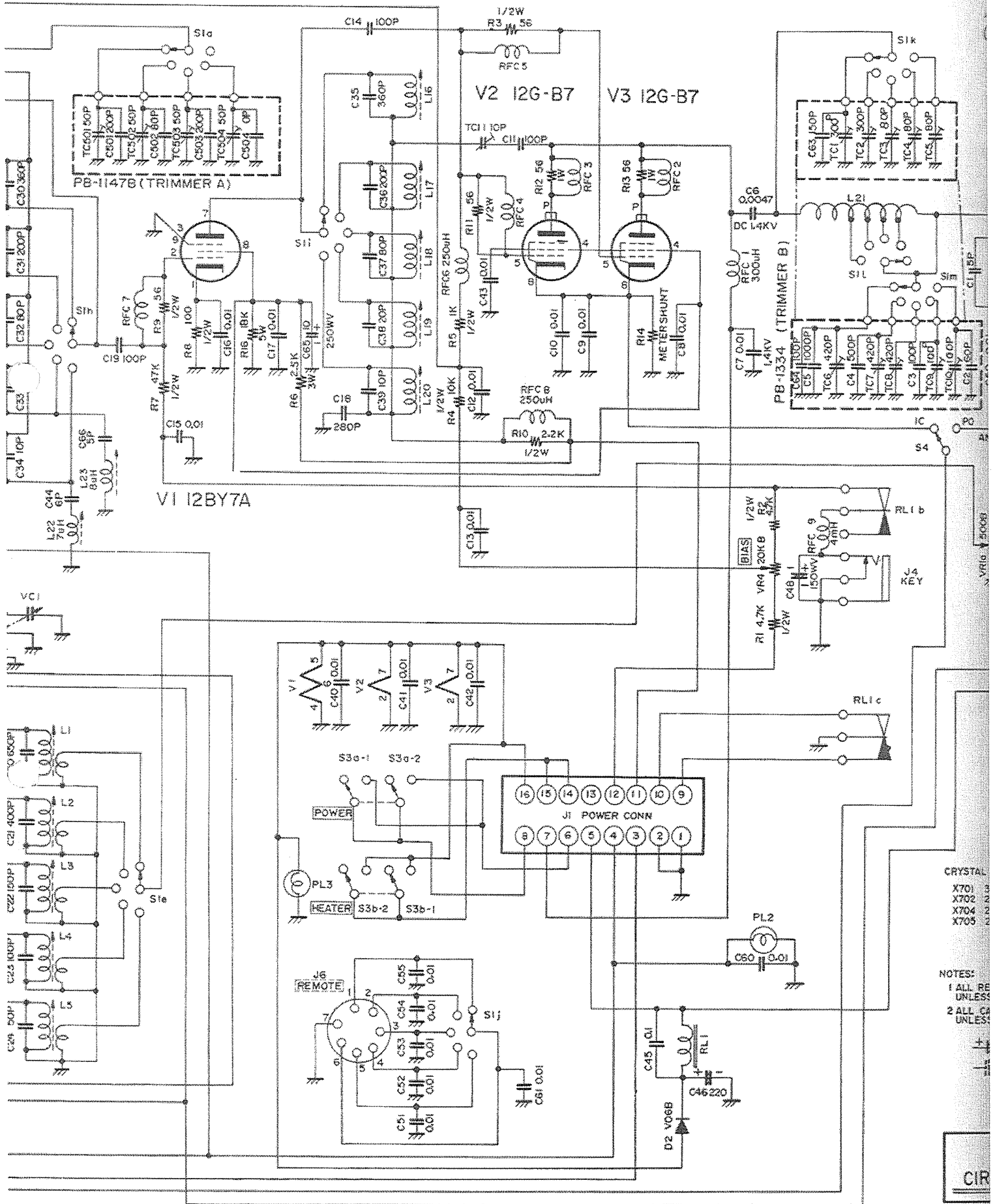
PB-1148B (X TAL)

PB-1154 (SWI VFO CH)

PB-1335 (RF)



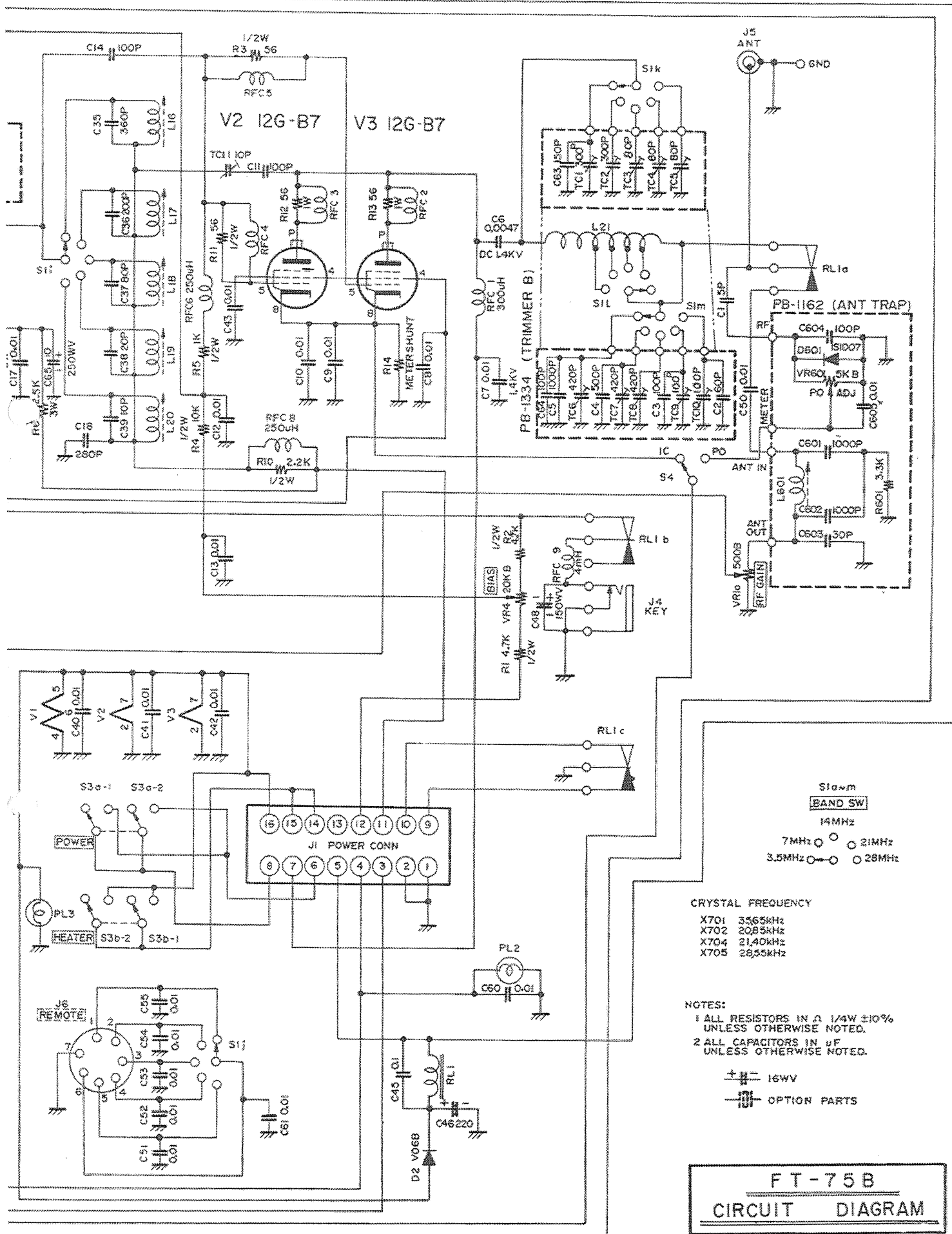




CRYSTAL
 X701
 X702
 X704
 X705

NOTES:
 1 ALL RE
 UNLESS
 2 ALL CA
 UNLESS

CIR



BAND SW
 14MHz
 7MHz
 3.5MHz
 21MHz
 28MHz

CRYSTAL FREQUENCY
 X701 35,65kHz
 X702 20,85kHz
 X704 21,40kHz
 X705 26,55kHz

NOTES:
 1 ALL RESISTORS IN Ω 1/4W ±10% UNLESS OTHERWISE NOTED.
 2 ALL CAPACITORS IN μF UNLESS OTHERWISE NOTED.

⊕ = 16WV
 ⊕ = OPTION PARTS

FT-75B
CIRCUIT DIAGRAM