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INSTRUCTION MANUAL FOR MODEL JST-125



Japan Radio Co., Ltd.

HF TRANSCEIVER

Thank you for purchasing the JST-125 HF Transceiver.

It is a high quality model with the latest digital circuits and semiconductors developed from many years of JRC's experiences and achievements in the field of radio communication. Please read through this manual before use.

The product you have purchased is produced under strict quality control. Should you find any trouble or damage, please contact the nearby JRC branch or dealer as soon as possible.

Accessories

The following accessories are provided with the JST-125. Please check them after unpacking.

- Instruction manual 1
- Microphone plug (8P) 1
- Key plug 1
- RCA pin plug 2
- Accessory connector (12P) 1
- Fuse (100W type: 30A, 10W type: 5A) 2
- DC power cable 1
- PC board puller 2

We recommend you to keep the shipping box for future transportation of after services, etc..

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1. FEATURES

— The latest technology has developed the excellent transceiver —

1. General Coverage Reception

This transceiver has the receiver which covers the frequency range of 100kHz to 30MHz continuously, besides the amateur bands of 1.8 to 28MHz. Thus, it can receive many kinds of signals from MF (medium frequency) to HF (high frequency).

2. Automatic Antenna Tuner Available (Option)

By connecting the NFG-220 Automatic antenna tuner, it becomes possible to perform the perfect matching instantaneously on all bands with one antenna. This tuner has a microcomputer so that the ideal matching can be obtained instantaneously against any antenna. Moreover, wide matching range, complete water-proof and fully automatic tuning have been realized, considering the close installation to an antenna. Therefore, this tuner does not require to select installation place. Here, the ideal tuner has been developed.

3. Superior Receiver Front End Circuit

The receiver employs double superheterodyne system by up-conversion those first IF is 70.455 MHz and 2nd is 455kHz. To ensure superior 2-signal characteristic, low-noise figure junction FET is used at its front end. This FET realizes the wide dynamic range characteristic.

4. Microcomputer Controlled Various Functions

- Complete PLL System by the Digital VFO
All of the internal local oscillator circuits have been designed in PLL and they are controlled by the microcomputer so as to realize the accurate VFO in 10Hz steps.
- 2-VFO System
This transceiver is equipped with two digital VFOs so that the different frequencies and modes can be set freely and that the split-operation is also capable. Needless to say, the equalization switch that makes 2 VFOs coincident is provided.
- Large Capacity Memory
The large capacity memory of storing 72 channels is provided. Frequencies and modes can be stored in that memory.
- Frequency UP/DOWN Switches
UP/DOWN switches are very convenient for fast-forwarding or fast-backwarding the frequency.
- Multi-function Main Dial
The main dial can be also operated as RIT control with one-touch operation, besides the use for setting the operating frequency.

• Scanning Functions

The JST-125 has the function of scanning six memory groups A through F in the channel selected with the memory channel switch. Because the memory of the JST-125 includes not only the frequencies but modes, the JST-125 is especially effective to scanning for reception in different modes.

• Priority Checking Functions

During reception of other frequencies, the priority checking function works to receive a particular memory channel at a fixed interval. Thus, you can keep watch on a certain channel.

5. Various Interference Eliminating Functions

• PBT (Pass-Band Tuning)

When there is an interference signal adjacent to the receiving frequency, this PBT function can eliminate the interference signal by changing the IF bandwidth.

• NB (Noise Blanker)

This transceiver is equipped with the noise blanker circuit which can also eliminate the woodpecker noise besides the ignition noise.

• Notch (IF Notch)

The notch filter is provided at the IF circuit to eliminate the beat interference without attenuating the desired signal.

6. Remote Control with Personal Computer

Connection of the optional RS-232C interface unit NMC-325 allows remote control with an external device (e.g. a personal computer) having an RS-232C port.

7. Complete Modular Design

All PC boards are complete modular design using the plug-in system. Each unit is connected with the mother board so as to connect units without wires, to unify the quality and to improve the reliability.

8. Panel Layout For Easy Operation

The panel layout and cosmetic design have been made with enough consideration of functions and operations. Moreover, high grade knob for the main dial ensures outstanding feeling. Also, the panel has been designed with one function for one control knob.

2. PRECAUTIONS BEFORE USE

2.1 Installation Place

Select a well ventilated area for installation place. Avoid areas where the equipment would be exposed to direct sunlight, hot air, dust, vibration, moisture etc.. Great care should be taken to ensure sufficient ventilation for heat radiation from the heat sink.

2.2 Connection

Make basic connections as shown in Fig. 2.1.

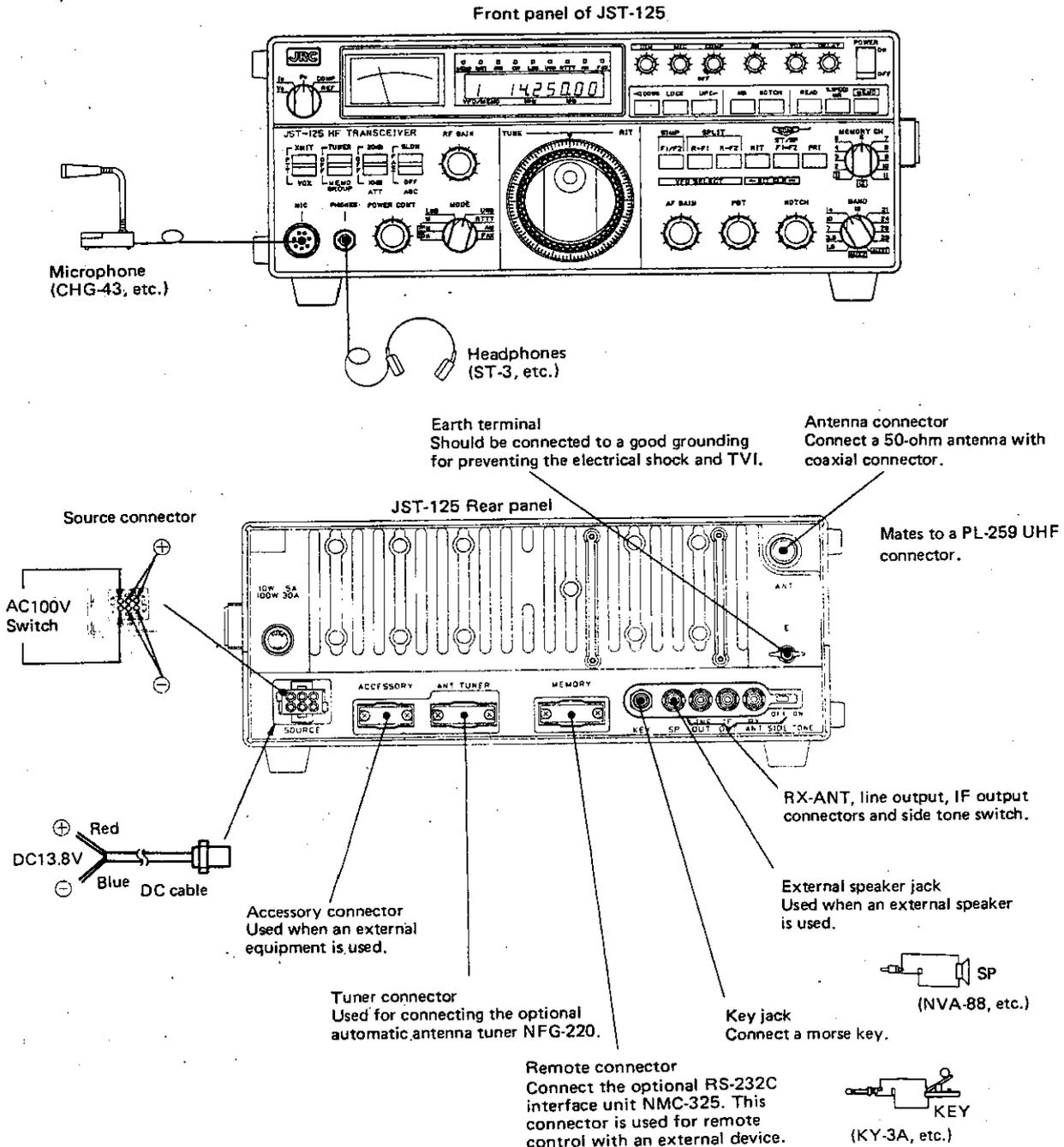


Figure 2.1 Basic Connections of the Front and Rear Panels

2.2.1 Power Supply

JST-125 operates on 13.8VDC $\pm 10\%$. The model JST-125D (100W type) requires about 20A and JST-125S (10W type) about 5A. First, check the voltage and current capacity of the external power source to be connected. Then, connect the equipment to the DC power source by using the supplied DC-power cable. For operation on AC power source, the optional AC power supply NBD-500 is available.

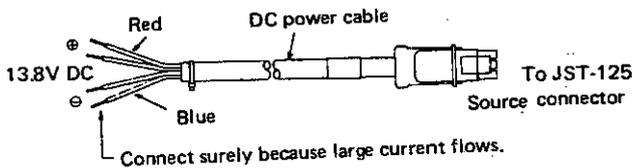


Figure 2.2 DC Power Cable Connection

2.2.2 Antenna

Since the antenna impedance of JST-125 is 50 ohms, use the 50-ohm type antenna. If impossible for 50 ohms, use an antenna tuner externally and tune for correct matching. If the matching is poor, that means high SWR, a part of the output power will be reflected at the input end. As a result, the power can't fully be fed and the transceiver may not provide the rated output power because of its load being away from 50 ohms (pure resistive). For these reasons, adjust the antenna, coaxial cable, earth, antenna tuner, etc. to approach SWR to 1 as closely as possible. But even if good matching is obtained between the transceiver and coaxial cable, if a mismatch exists between the antenna and coaxial cable, full power can't be fed to the antenna through the coaxial cable. Carefully select the antenna installation place to ensure full power transmission.

To efficiently transmit the output power, not only take care of the antenna, but also pay attention to the earth work. Especially for a grounded type antenna, its earth (or other substitute such as counterpoise and radial earth) should be regarded as an important part of the antenna system. Even when using a balanced type antenna, connect its earth wire to the earth terminal of the transceiver to suppress spurious and other undesired radiations and ensure safety.

2.2.3 Grounding

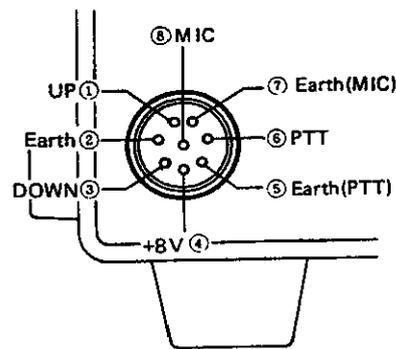
A good grounding is always important for safety and reduction of interferences. Be sure to connect the earth terminals of JST-125, AC power supply, peripheral equipments, etc. to the ground for preventing electrical shocks. In order to prevent the interferences to other equipments by reducing the spurious radiation and also

eliminate the interferences from other equipments, use a thick copper wire, copper braided wire or copper tape etc. with the shortest run.

Never connect the earth wire to any gas pipe or cable duct. Also, there is a case where a water pipe is not grounded. Thus, we recommend you to perform grounding work specially.

2.2.4 Microphone Connection

Used to connect a microphone. Fig. 2.3 shows the connection. When the optional microphone NVT-58 with the UP/DOWN switches is to be used, the frequency can be adjusted with the UP/DOWN switch on the microphone.



MIC connector (Seen from the front panel)

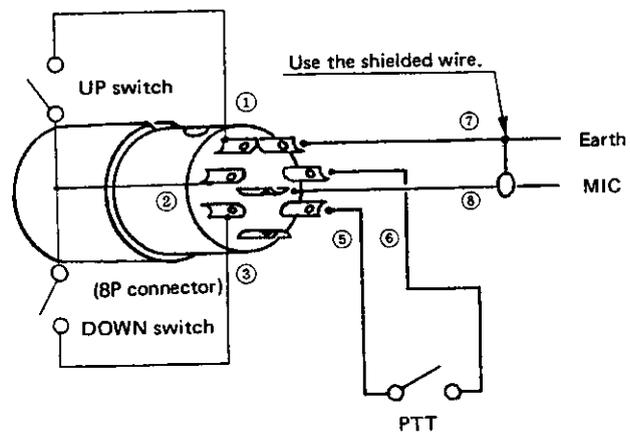


Figure 2.3 Wiring of Microphone Connector

2.2.5 Key connection

For CW operation, insert a morse key to the KEY jack on the rear panel. Connect the supplied key plug and a morse key as shown in Fig. 2.4.

CAUTION

Do not apply an excessively high voltage or any negative voltage to the CW keying circuit, because it operates on TTL level of +5V system.



Figure 2.4 Key Connection

2.2.6 Speaker Connection

Since the JST-125 contains a speaker, it can be used without an external speaker. However, for better sound quality and higher sound volume, the optional external speaker NVA-88 is available.

In that case, connect the plug of NVA-88 to the SP jack on the rear panel. This causes the internal speaker to be silenced.

When using any other speaker, select it having an impedance of 4 to 8 ohms and maximum input of 3 to 5W and use the supplied pin-plug.

2.2.7 Antenna Tuner Connection

If SWR of the antenna connected to JST-125 is far higher than 1.0, use the optional automatic antenna tuner, NFG-220 or antenna tuner NFG-97, etc. between the antenna and transceiver for good impedance matching in such a sense of efficient power transmission and preventing the interferences. When using the antenna tuner NFG-97, connect the earth terminal of the transceiver and the one of the antenna tuner as short as possible.

3. OPERATING CONTROLS ON PANEL

3.1 Front Panel Controls

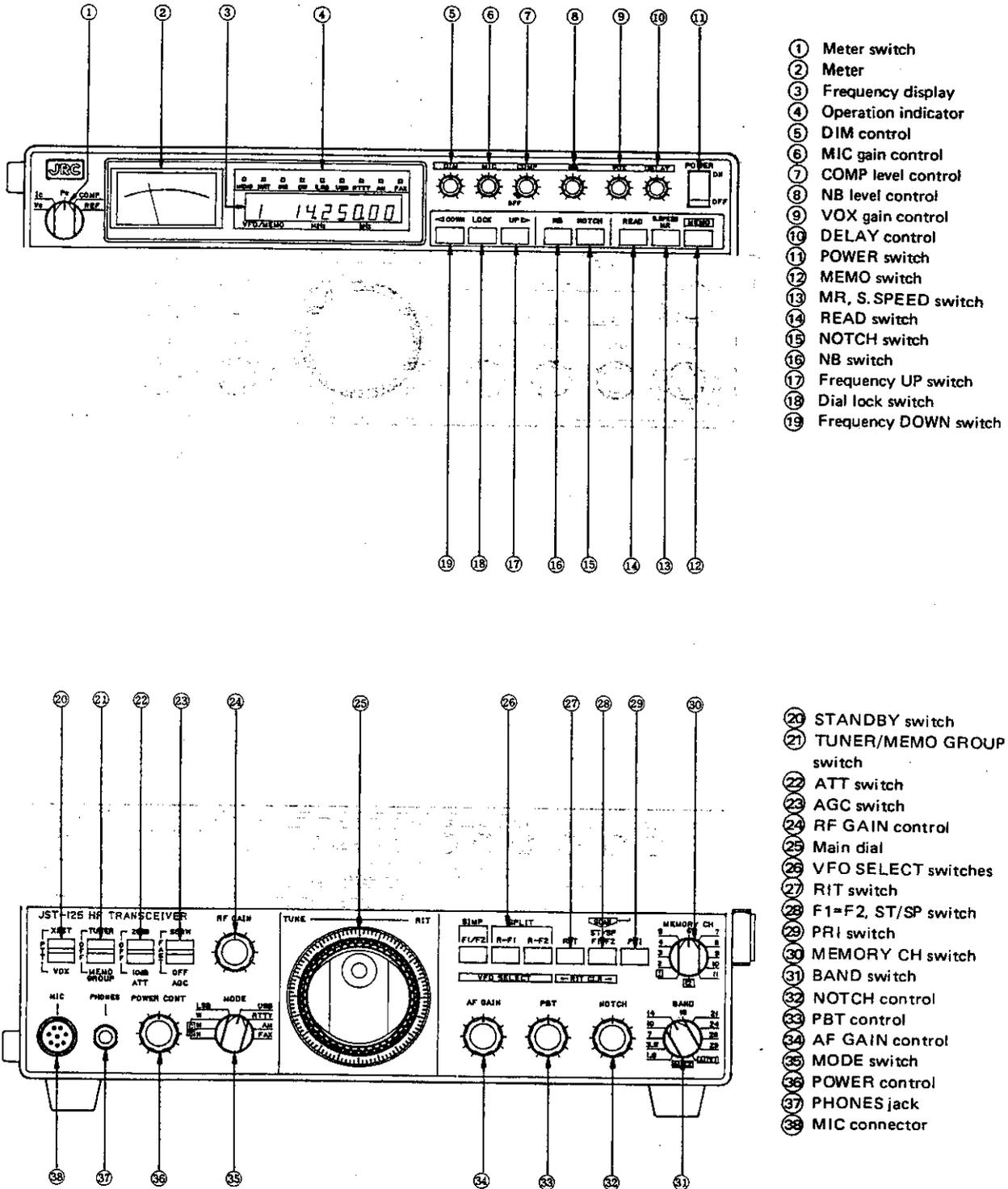


Figure 3.1 Front Panel Controls

① Meter selector switch

Selects the check meter indication one of five transmitting conditions.

Vc DC source voltage, 25V full scale

Ic Final stage collector current. Full scale and typical values are as follows:

	Full scale	Typical reading
100W model	25A	15 - 20A
10W model	2.5A	1.8 - 2.2A

Po Transmitter output power
Percent of the rated output (100W or 10W) when connecting a 50-ohm load to the ANT terminal.

If the VSWR is too high, the reading may greatly differ from the actual value.

COMP Compression level in the RF speech processor

REF Reflected power at transmitting
Usable as an indicator for the matching adjustment of the external antenna tuner and also for checking the antenna matching condition.
Since the meter sensitivity is high enough for fine adjustment, the output power will be satisfactory even if the meter deflects slightly.

② Meter

Acts as an S-meter during reception and as a check meter of operating condition during transmission.

The meter selector switch ① changes the meter indication during transmission.

③ Frequency display

Displays the operating frequency down to 10-Hz digit or RIT frequency (the RIT frequency is up to ± 20 kHz). This frequency display displays VFO number (1 or 2) and group of memory channels at the left ahead of the display.

And it is also used to indicate the scanning speed.

④ Operation indicators

Displays the operating mode by nine LEDs (light-emitting diodes).

MEMO Indicates that the internal memory is in the access status.

When depressing the MEMO switch ⑫ or MR switch ⑬, the MEMO LED illuminates for about 0.5 second to indicate the data have been stored in the memory. When calling the data from the memory channel by depressing the READ switch ⑭, the MEMO LED also illuminates.

Please wait for until it goes out.

XMIT Indicates that the transceiver is on the transmitting condition. Do not change the band switch and mode switch when illuminating.

OVR Indicates whether the voice input level is good or not. In case of excessively high Mic. gain, the red OVR LED illuminates. It is the optimum level to flash only at peaks.

CW Indicates the CW mode.

LSB Indicates the LSB mode.

USB Indicates the USB mode.

RTTY Indicates the RTTY mode.

AM Indicates the AM mode.

FAX Indicates the FAX mode.

⑤ DIM (Dimmer) control

Adjusts the brightness of meter lamp, frequency display and operation indicator LEDs. Adjust relative to desired brightness.

⑥ MIC (Microphone) gain control

Adjust the microphone amplifier gain for transmission. While observing the over-modulation indicator OVR LED ④, set it for an optimum level in accordance with the operator's voice level and microphone sensitivity.

⑦ COMP (Compression) level control

Adjusts the compression level in the RF speech processor. Set the meter switch ① to the COMP position. Applying the voice signal from the microphone, adjust the COMP level control. An adequate compression level may be about 10dB at which the sound quality deterioration is less and enough talk power-up effect can be expected.

This control knob also has an ON/OFF switch. Thus, if turned fully counterclockwise, the level becomes off.

⑧ NB (noise blanker) level control

Adjusts the threshold level of the noise blanker. Adjust it for the best-operation suited to the signal strength, type and level of the noise.

⑨ VOX gain control

Adjust the gain of VOX amplifier at VOX operation. Adjust the gain so as to obtain the best VOX operation.

⑩ DELAY control

Adjusts the delay time at VOX operation. Adjust it for the best operation.

⑪ POWER switch

Switches ON-OFF the power of JST-125. When using either NBD-500 or NBD-515 external AC power supply, this switch also turns ON-OFF the AC power supply.

⑫ MEMO (Memory write) switch

Depress to store the operating frequency together with mode into a channel selected by the MEMORY CH switch ⑳ and MEMO group switch ㉑.

When depressing this switch, the MEMO LED on the operation indicator ④ momentarily lights up to indicate the CPU has accepted the data.

⑬ MR (Memory recall), S.SPEED (Scan speed) switch

Depress when the frequency data (including mode) stored in the channel selected by the MEMORY CH switch ⑩ and MEMO group switch ⑫ are recalled. When depressing this switch, the MEMO LED on the operation indicator ④ momentarily lights up.

When the READ switch is on, the scanning speed can be set with this switch. Further, the frequency display ③ indicates the scanning speed during setting of the scanning speed.

⑭ READ (Memory read) switch

Depress to read out the frequency data from selected memory channel and makes the transceiver operate on the selected data, as keeping the frequency data (including mode) of either F1 or F2 which has been used. Depressing the READ switch once again, the transceiver will return to operate on the former frequency data.

You can scan the memory groups A through F for the channel specified with the MEMORY CH switch ⑩ by manipulating the ST/SP switch ⑲ with the READ (Memory Read) switch depressed.

⑮ NOTCH switch

Switches ON-OFF the notch filter. The notch frequency is adjusted by the notch control ⑳.

⑯ NB (Noise Blanker) switch

Enables the noise blanker to operate. In cases such as noise as the automobile's ignition noise interferes, use it together with the noise blanker control ⑳.

⑰, ⑱ Frequency UP/DOWN switches

Depress to quickly changes the frequency. By the UP switch, the frequency increases, on the other hand, by the DOWN switch, the frequency decreases.

⑲ LOCK (Dial lock) switch

Inhibits the main dial and UP/DOWN functions electrically.

It is useful for preventing the frequency change due to vibration or mis-operation. Depressing the lock switch once again, the lock condition will be cleared.

⑳ Standby switch

Changes over the transmitting and receiving modes. Three positions such as XMIT, PTT and VOX are provided.

XMIT Manual switching to transmitting condition.

PTT The transceiver is in a receiving condition. But depressing PTT switch (Press-To-Talk switch) changes to the transmitting condition.

VOX The transceiver is in a receiving condition. During SSB operation, switched to transmit by a voice input and returns to receive with no voice.

During CW, the transceiver will turn to transmit when keying.

When keying ends, it will automatically return to receive. The VOX switch is used with the VOX gain control ⑨ and DELAY control ⑩.

㉑ TUNER/MEMO GROUP switch

TUNER Starts tuning with the optional automatic antenna tuner NFG-220. During tuning, the frequency display ③ blinks.

MEMO GROUP Selects the group of the memory channels. Groups from A to F are displayed on the fluorescence display.

㉒ ATT (Attenuator) switch

Changes the attenuation of the receiving input circuit to OFF, 10dB and 20dB. At heavy interference due to obstructive strong signals, set to the 10dB or 20dB position. Normally set to OFF.

㉓ AGC switch

Selects the time constant in the AGC circuit.

SLOW Long time constant
Available for normal SSB operation.

FAST Short time constant
Available for CW operation, and also SSB operation for reception of alternate strong and weak signals during a round-table QSO, selection of station, etc..

OFF AGC off, 0 time constant
Since the receiver gain becomes maximum, the RF GAIN control ㉔ should be adjusted against a strong signal.

㉔ RF GAIN control

Adjusts the gain of RF and IF circuits. Normally set to fully clockwise position for maximum sensitivity. When the desired signal is strong, lower the RF gain, then the comfortable receiving condition may be obtained.

㉕ Main dial

Sets the operating frequency in 10Hz steps, and one rotation covers 10kHz. With depressed RIT switch, this acts as the RIT dial and one rotation covers approx. 2.5kHz. Also, this can cover the frequency continuously from 100kHz to 30MHz without changing the BAND switch ③.

㉖ VFO SELECT switches

Selects either VFO, F1 or F2.

F1/F2 Used for simplex operation utilizing VFO of F1 or F2. Each time the switch is pressed, F1 and F2 are selected alternately.

R-F1 VFO-F1 for reception and F2 for transmission in the split operation.

R-F2 VFO-F2 for reception and F1 for transmission in the split operation.

- ②7 **RIT switch**
Enables RIT function to operate. At the ON position, the frequency display indicates the RIT frequency. By depressing this switch together with F1 = F2 switch ②8, the RIT frequency will be cleared.
- ②8 **F1 = F2, ST/SP (scan start/stop) switch**
F1 = F2 Equals VFO-F1 and F2 frequency and mode. When working F1 or R-F1, F2 frequency data are changed to F1.
When working F2 or R-F2, F1 frequency data are changed to F2.
When this switch is pressed with the READ switch ①4 depressed, six memory groups A through F for the channel selected with the MEMORY CH switch ③0 are scanned. To stop the scanning, press this switch again, or press the PTT switch on the microphone.
- ②9 **PRI (Priority check) switch**
Used for privileged reception of a particular memory channel at a fixed interval. For details, see 4.8.
- ③0 **MEMORY CH (Memory channel) switch**
Selects one out of memory channels from 1 to 12. This switch is used together with the MEMORY GROUP switch ②1. The position 12 is used to select an ordinary memory channel. In addition, it can be used for remote control of the frequency, mode, and scan start/stop when the optional RS-232C interface unit NMC-325 is connected.
- ③1 **BAND switch**
Selects the band. The desired bands can be set at AUX1 and AUX2 positions. For detailed information, refer to Paragraph 4.6.4.
- ③2 **NOTCH control**
Adjusts the notch frequency.
- ③3 **PBT (Pass Band Tuning) control**
Adjusts the pass-band tuning frequency. When a interference signal exists near the desired signal, this control is available to eliminate the interference by narrowing the IF bandwidth from the lower or higher frequency. Normally set it at the center click position. For detailed information, refer to Paragraph 4.2.4.
- ③4 **AF GAIN control**
Adjusts the sound volume in reception.
- ③5 **MODE switch**
Selects the emission mode. Both CW-M and CW-N positions require the optional filters, CFL-260 and CFL-230, respectively. At AM, only the reception is available. The transmitter can't operate.
- ③6 **POWER CONTROL**
Adjusts the transmitting power. At the fully clockwise position, the power becomes maximum. As rotating counterclockwise, the output power gradually reduces. At the minimum position, the power becomes approximately 1/10 of the rated output.
- ③7 **PHONES (Headphones) jack**
Whenever headphones is plugged in, the speaker is disconnected.
- ③8 **MIC (Microphone) connector**
Microphone should be connected. As for detailed information, refer to Paragraph 2.2.4.

3.2 Rear Panel Description

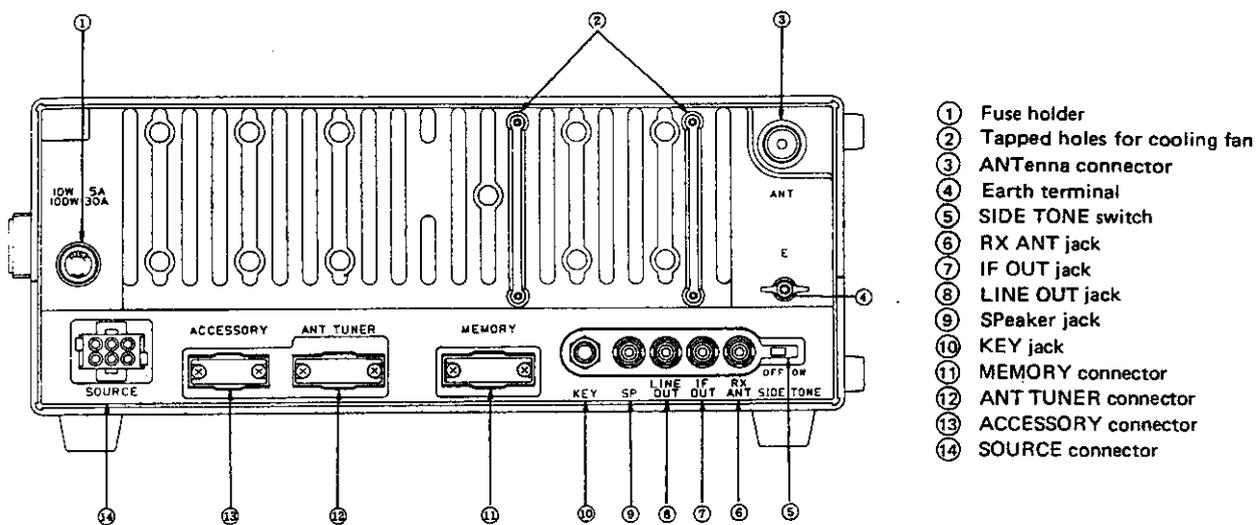


Figure 3.2 Rear Panel

① Fuse holder

The model JST-125D (100W type) uses a fuse of 30A and the model JST-125S (10W type) 5A. If the fuse is blown out, investigate the cause thoroughly and replace with a fuse of the same capacity.

② Tapped holes for cooling fan

Holes for mounting a cooling fan which is used when this transceiver is used for a long time transmission in the heavy duty such as RTTY, FAX mode.

③ ANT (Antenna) connector

UHF-type connector for a 50-ohm antenna

④ E (Earth) terminal

Connected the earth wires of an antenna tuner, AC power supply, and other peripheral units. Also connected the main earth wire from the ground.

⑤ SIDE TONE switch

Turns on and off the side tone for CW keying monitor.

⑥ RX ANT (Receiving antenna) jack

Used for connecting a receiving antenna to the JST-125 or an antenna to a separate receiver. Refer to Paragraph 4.9.3.

⑦ IF OUT jack

For IF output signal of 455kHz in the receiver. After passing through the IF filter, the receiving signal whose output level is stabilized by the AGC circuit is taken out, providing approximately 5m Vrms across a load of 75 ohms.

⑧ LINE OUT jack

For receiving AF output signal. For recording, insert an external attenuator of 40 to 60dB, because the output level is approx. -10dBm.

⑨ SP (External speaker) jack

For connecting a speaker of 4 to 8 ohms impedance and input of 3 to 5 watts by using the supplied plug.

Any of JRC's speaker such as NVA-88, NVA-515 and NVA-505 is adaptable. Whenever a plug is put into this jack, the internal speaker is disconnected.

⑩ KEY jack

For connection of a morse key.

⑪ MEMORY connector

For remote control of JST-125 with an external device. Set the MEMORY CH switch on the front panel at **12**, and connect the RS-232C interface unit NMC-325 (optional). Thus, the frequency, mode, scanning start/stop can be remotely controlled with an external device (e.g. a personal computer).

⑫ ANT TUNER connector

For connecting the optional automatic antenna tuner NFG-220. The ALC signal can be applied to reduce the output power in tuning mode. See Paragraph 4.9.7 for each pin arrangement.

⑬ ACCESSORY connector

For various input and output signals from and to external units. See Paragraph 4.9.5 as for detailed information.

⑭ SOURCE connector

For supplying 13.8VDC to JST-125. Use the supplied DC power cable. For AC power operation, connect the DC output cable of the NBD-500 AC power supply to this connector.

4. OPERATION

4.1 Reception

This section describes the basic receiving operation.

4.1.1 Receiving Procedures

- (1) After completing the connections of the DC power cable, antenna, etc. with the POWER switch set to OFF, set controls and switches as shown below:

Controls and Switches	Position
Standby switch (20)	PTT
DIM (Dimmer) control (5)	Fully clockwise
READ (Memory read) switch (14)	OFF
RIT switch (27)	OFF
PRI (Priority check) switch (29)	OFF
NOTCH switch (15)	OFF
NB (Noise Blanker) switch (16)	OFF
LOCK switch (18)	OFF
ATT (Attenuator) switch (22)	OFF
AGC switch (23)	FAST
RF GAIN control (24)	Fully clockwise
VFO SELECT switch (26)	F1/F2
AF GAIN control (34)	Fully counterclockwise
PBT (Pass Band Tuning) control (33)	Center

Table 4.1 Preparation

- (2) Check that meter illumination, frequency display, etc. light up by turning the POWER switch (11) to ON.
- (3) Set the BAND switch (31) and MODE switch (35) to the desired band and mode respectively. Then, adjust the sound volume by rotating the AF GAIN control (34).
- (4) For changing the frequency widely, use either UP (17) or DOWN (19) switch. When UP/DOWN switch is kept depressed, the frequency will change continuously from 100kHz to 30MHz.

4.1.2 Frequency Reading

The frequency display (3) indicates the frequency according to the mode as shown below: (Fig. 4.1)

USB, LSB	Suppressed carrier frequency in transmission and reception
CW	Frequency of actually emitted signal in transmission. In reception, the frequency of the received signal which is demodulated into a sound of 800Hz.
RTTY	Center frequency of mark and space signal in transmission. In reception, the frequency of the received signal which is demodulated into mark-space signal of 2210Hz in the center frequency.

AM

FAX mode

Carrier frequency of the received signal
Center frequency of mark and space signal in transmission and reception.
In reception, the frequency of the received signal which demodulated into mark-space signal of 1900Hz in the center frequency.

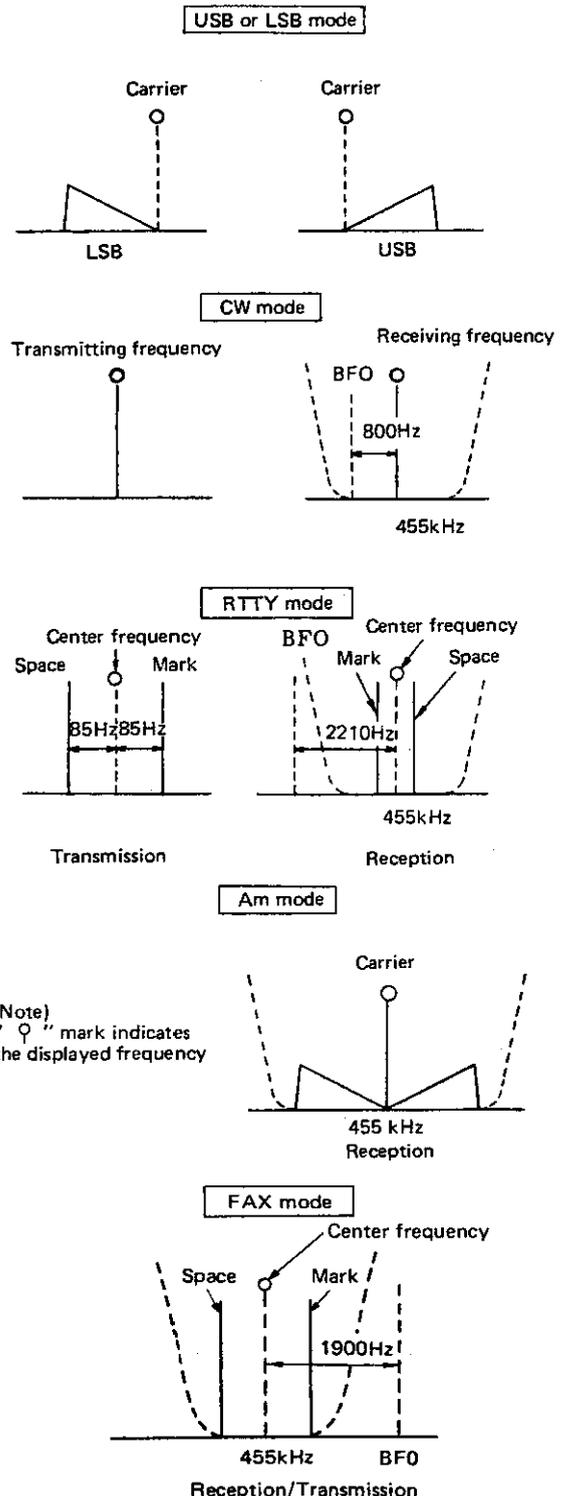


Figure 4.1 Frequency Display

4.1.3 SSB Reception

- (1) Set the AGC switch (23) to SLOW and the BAND switch (31) to the desired band.
- (2) Set the MODE switch (35) to SSB. Customary, LSB mode is used less than 10MHz and USB mode more than 10MHz.
- (3) Slowly rotate the main dial until the desired SSB signal is clearly heard and the S-meter deflects maximally.

4.1.4 CW Reception

- (1) Set the AGC switch (23) to FAST and the BAND switch (31) to the desired band.
- (2) Set the MODE switch (35) to CW-W.
- (3) Slowly rotate the main dial to hear the desired CW signal. In the CW mode, the receiving frequency of the own station and the transmitting frequency of the partner's station will agree each other when the demodulated tone becomes 800Hz.

NOTE

CW-M and CW-N modes of the MODE switch (35) can't be used without the optional CW filter.

4.1.5 RTTY Reception

- (1) A demodulator or teletypewriter, etc. are required for receiving an RTTY signal. See Fig. 4.22 in 4.9.4.
- (2) Set the MODE switch (35) to RTTY and the BAND switch (31) to the desired band.
- (3) Slowly rotate the main dial to search for an RTTY signal. Then, adjust the dial so that the demodulated tone becomes about 2210Hz. Further, finely adjust the main dial as observing the indicator on the demodulator.
- (4) Fig. 4.2 shows the frequency relation of the mark and space of a received RTTY signal. These figures show an example of RTTY signal with shift of 170Hz (± 85 Hz). The " f_{DSP} " in Fig. 4.2 is the frequency which is indicated on the frequency display when correctly tuned.

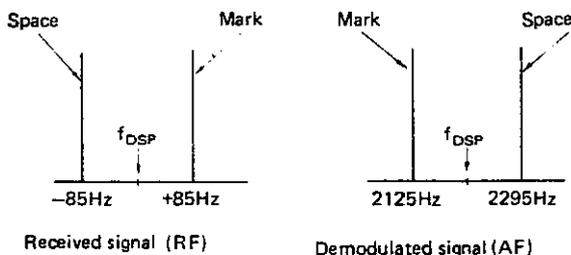


Figure 4.2 Frequency Relation of Received RTTY Signal

4.1.6 AM Reception

- (1) Set the MODE switch (35) to AM and the BAND switch (31) to the desired band.
- (2) Slowly rotate the main dial (25) until the AM signal is heard and adjust it so that the signal can be heard clearly and the S-meter deflects maximally.

4.1.7 FAX Reception

- (1) A facsimile unit is required for receiving a FAX signal. See Fig. 4.23 in 4.9.4.
- (2) Set the MODE switch (35) to FAX, and the BAND switch (31) to the desired band.
- (3) Turn the main dial (25) so that the demodulated tone may be set at about 1900Hz when the FAX signal is received. Then, make fine adjustment while observing the indicator on the FAX equipment.
- (4) Fig. 4.3 shows the relations between the mark and space frequencies in the received FAX signal. In this example, the center frequency (1900Hz) with the shift width of 800Hz (± 400 Hz) between the mark and space is indicated.

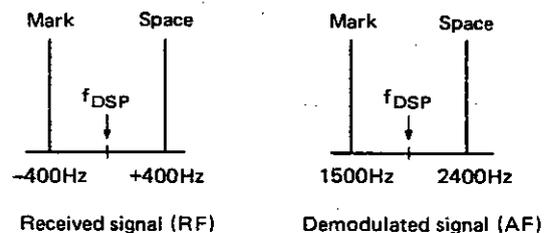


Fig. 4.3 Frequency Relation of Received FAX Signal

NOTE

For receiving the standard wave (WWV), set the BAND switch (31) to 10MHz position and tune the frequency to 10.000.00MHz by turning the main dial (25).

4.2 Receiving Functions

This section describes the receiving functions for picking up the desired signal in the interference and noise.

4.2.1 ATT (Attenuator)

This switch is used in case where the desired signal is blocked by the strong adjacent unwanted signal or affected by the intermodulation interference. Depending on the strength of the interference, set the ATT switch to 10dB or 20dB position so that the desired signal can be received clearly.

4.2.2 AGC Switch

This switch is used for changing the time constant of the AGC circuit and making it off.

- SLOW For SSB reception
- FAST For CW reception or tuning the station by the main dial and UP/DOWN switches.
- OFF For receiving the weak signal. In this case, the S-meter does not deflect.

4.2.3 RF GAIN

This knob adjusts the gain of 1st and 2nd IF amplifier. At the fully clockwise position, the maximum gain is provided. As rotating this knob in the counterclockwise direction from the fully clockwise position, the gain is reduced. At the same time, the S-meter starts to deflect. At the S9 position of the S-meter indication, the total gain of 1st and 2nd IF amp. is reduced by about 40dB. At the fully counterclockwise position, the gain is reduced more, and neither the received signal nor noise can be heard. Also, at this time, the S-meter becomes to indicate the full scale.

When receiving the comparatively strong signal, adjust this control so that the S-meter reading becomes almost the same or a little less than the value read on it. As a result of the above adjustment, the noise will be reduced and the signal can be heard clearly. Usually, use this control at the fully clockwise position.

4.2.4 PBT (Pass Band Tuning)

PBT is the system to eliminate the adjacent undesired signal by narrowing the IF bandwidth without changing the receiving frequency. For example, when the PBT knob is at the center position (center-click position) and the received signal suffers from an interference signal as shown in Fig. 4.4, the obstructive signal can be eliminated by narrowing the bandwidth by rotating the PBT knob. In case where the interference signal is placed at the opposite side to the one in the figure, the obstruction can be eliminated by rotating the PBT knob reversely.

This PBT is applicable to all of modes except AM. However, when CW-M and CW-N optional filters are used in the CW mode, the function starts to work from the position where the knob is rotated a little.

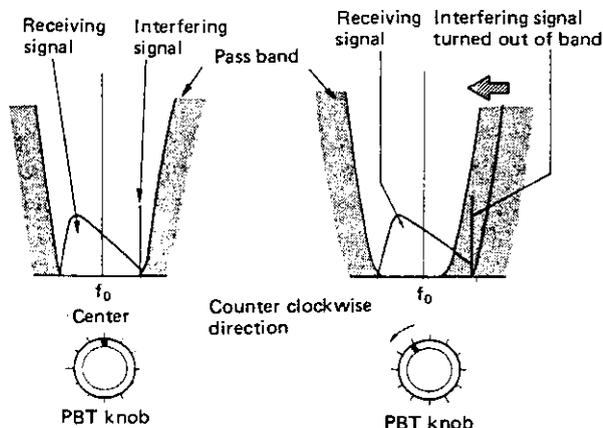


Figure 4.4 PBT Function

4.2.5 NOTCH Filter

The notch filter eliminates a beat interference by carrier and CW. Depress the NOTCH switch (15), and adjust the NOTCH control (32) so that the beat interference becomes minimum.

Fig. 4.5 shows the operation of the notch filter.

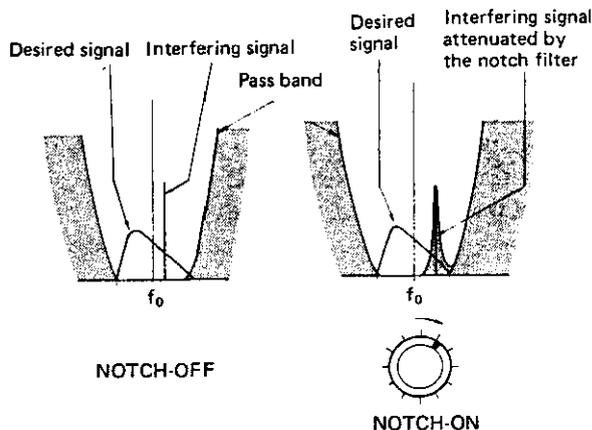


Figure 4.5 Operation of NOTCH Filter

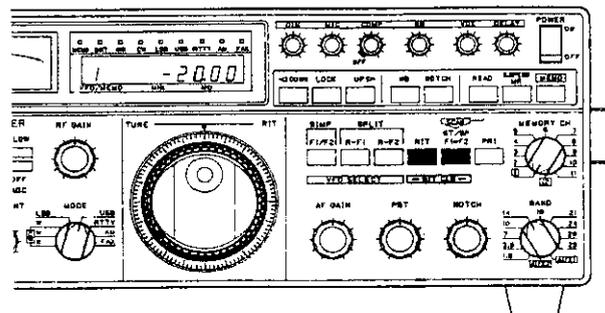
4.2.6 NB (Noise Blanker)

The noise blanker can eliminate the various noises such as car's ignition noise with narrow pulses and wood pecker's one with wide pulses. Set the NB switch (16) to ON and adjust the NB control (8) for minimum interference. As turning clockwise, the lower level noise can be eliminated. Turning the knob too clockwise may deteriorate the sound when there is an adjacent strong interference signal.

4.2.7 RIT (Receiver Increment Tuning)

Only the receiving frequency can be changed within $\pm 20\text{kHz}$ without changing the transmitting frequency. When the partner's frequency is shifted, use this RIT function. The main dial (25) works as the RIT control by setting the RIT switch to ON, and fine tuning is possible. At this time, the frequency display (3) indicates the RIT frequency.

Also, if the RIT switch is set to OFF with F1 = F2 switch depressed during the RIT operation, the RIT frequency will be cleared.



Set the RIT switch to OFF as depressing the F1=F2 switch.

Figure 4.6 Clear of RIT Frequency

NOTES

- Even though the RIT frequency is displayed, the transmitting frequency will be displayed during transmission.
- The transmitting frequency and receiving one are different during the RIT operation. Thus, before calling another station, be sure to set the RIT switch to OFF.

4.3 Transmission**NOTES**

- Thoroughly read this clause and be familiar with the operating procedure before transmit. Improper operation of transmission may cause the transceiver to fail.
- Use the dummy load for transmission test. Be sure not to transmit with no antenna connection.
- The transceiver cannot transmit if the set frequency is out of the amateur bands. Moreover, the frequency cannot be set out of the amateur bands during transmission.

4.3.1 Transmitting Procedures**(1) Antenna**

JST-125 operates at the rated power when a 50-ohm antenna is connected. Use such an antenna whose impedance is 50 ohms and SWR is less than 1.5. If SWR of the antenna system is higher, the final transistors will be damaged or TVI etc. may occur. Thus, in such a case, we recommend to use our optional automatic antenna tuner NFG-220 or antenna tuner NFG-97.

(2) Preparation

Set controls and switches as follows. Leave other controls and switches set for reception as shown in Table 4.1.

Controls and Switches	Position
METER switch ①	IC
COMP control ⑦	Fully counterclockwise
MODE switch ⑳	RTTY
POWER CONTROL ⑳	Fully clockwise
BAND switch ㉑	Desired band
Main dial ㉒	Desired frequency

Table 4.2 Preparation

- (3) Set the Standby switch ㉓ to XMIT. Confirm that IC meter reading is from 15 to 20A. Then, set the Meter switch ① to REF position and check that the meter reading is less than the half of the full scale. When a reading is over the half, check SWR of the antenna system.

- (4) When the automatic antenna tuner NFG-220 is connected, set the TUNER/MEMORY GROUP switch ㉔ to the TUNER side. Then the automatic tuning starts and the frequency display ③ blinks during the tuning mode. Wait for performing other operations until the display stops blinking.

4.3.2 SSB Transmission

- (1) Connect a microphone to the MIC connector. Set the MODE switch ⑳ to USB or LSB and set the desired frequency by the main dial. Turn the COMP control ⑦ fully counterclockwise.
- (2) Then, set the Standby switch ㉓ to XMIT (or PTT on the microphone).
- (3) As speaking to the microphone as usual, adjust the MIC gain control ⑥ until the OVR LED of operation indicators ④ flashes in response to the peaks of voice.
- (4) The transmitting output can be adjusted by the POWER CONTROL ㉕.

4.3.3 CW Transmission

- (1) Connect a morse key into the KEY jack ⑩ on the rear panel (Fig. 3.2). Set the MODE switch ⑳ to CW. (When the optional filter is not mounted, set to CW-W.)
- (2) The transceiver emits CW signals when the Standby switch ㉓ is set to XMIT and the morse key is pressed.
- (3) The transmitting output can be adjusted by the POWER CONTROL ㉕.
- (4) The side-tone monitor sound can be turned on or off by the SIDE-TONE switch ⑤ on the rear panel.

4.3.4 RTTY Transmission

- (1) Connect the teletypewriter, demodulator and other devices necessary for RTTY as shown in Fig. 4.22 in 4.9.4.
- (2) Set the MODE switch ⑳ to RTTY and STANDBY switch ㉓ to XMIT.
- (3) Adjust the transmitting output by the POWER CONTROL ㉕.

NOTE

The 100W model is capable of continuously transmitting at the full power for about 10 minutes. For longer continuous operation, reduce the power to about 50%.

4.3.5 FAX Transmission

- (1) Connect the devices necessary for FAX communication as shown in Fig. 4.23 in 4.9.4.
- (2) Set the MODE switch ⑳ to FAX and standby switch ㉓ to the XMIT.

- (3) Adjust the transmitting output with the MIC GAIN control (6) or POWER CONT control (36).

NOTE

The 100W model is capable of continuously transmitting at the full power for about 10 minutes. For longer continuous operation, reduce the power to about 50%.

4.4 Transmitting Functions

4.4.1 VOX

When the standby switch (20) is set to VOX position, the transceiver automatically turns to transmit by the voice input through the microphone. The VOX function is applicable to SSB, CW and FAX mode (semi-break-in), not to RTTY.

- (1) VOX gain control

While talking to the microphone as usual, adjust the VOX gain control (9) so that the transceiver turns to transmit by the voice input. Note that too high VOX gain may cause the transceiver to respond to an ambient sound or noise.

- (2) DELAY control

This knob adjusts the delay time for turning from transmission to reception in the VOX operation. The clockwise rotation increases the delay time. Adjust it so that the transceiver will not return to reception in response to every short break of the voice such as pause.

- (3) ANTI VOX control

ANTI VOX control is to prevent the VOX function in response to the sound through the speaker. Adjust it so that VOX does not work in response to a normal sound volume. Adjust by using a screw driver through the adjusting hole located on the upper cover of JST-125. (Refer to "Adjustment of ANTI VOX" in 4.10.1.)

4.4.2 CW (Semi-break-in)

By setting the STANDBY switch (20) to VOX and pressing a morse key in the CW operation, the transceiver will automatically turn to transmit. (This function is called semi-break-in). The delay time of returning to reception can be adjusted by the DELAY control (10).

4.4.3 Speech Processor

The speech processor is available to increase the talk power. When your speech is almost inaudible at a partner station in SSB because of a weak signal of the own station, this speech processor is very effective. JST-125 employs the RF speech processor system.

[Operation]

Set the METER switch (1) to COMP position in transmission. While speaking into the microphone at an usual voice level and at the same time reading the meter, adjust the COMP control (7) so that the compression level becomes 10dB.

NOTES

- Increasing of the talk power is effective for better communication. However, too high talk power may deteriorate the sound quality.
- Speech processor is turned off at the fully counterclockwise position of the COMP control (7). When not using the speech processor, be sure to set to off.

4.5 Two-VFO System

JST-125 incorporates a high-class and high-performance two-VFO system, which allows the operator to easily operate a variety of features available for not only basic operations but also advanced techniques.

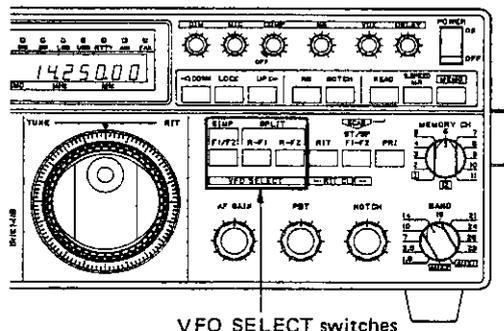


Figure 4.7

This section describes some basic operation available for utilizing the two-VFO system.

4.5.1 SIMP (Simplex) Operation

In the simplex operation, the transmitting frequency and the receiving one are the same. The simplex operation is performed as described below.

The F1/F2 button of the VFO SELECT switches (26) is used to select one of the two independent VFOs. Each time the button is pressed, the VFO F1 and VFO F2 is selected alternately, and the VFO No. 1 or 2 is indicated on the VFO/MEMO of the frequency display (3) accordingly. The mode and frequency for F1 (or F2) can be set independently of those for F2 (or F1).

Indicates that VFO-F1 is selected.

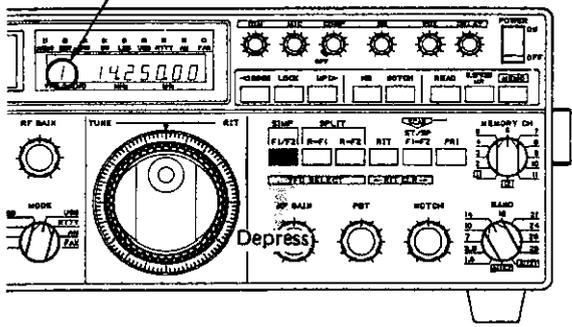


Figure 4.8 Display Example in the Simplex Operation (VFO-F1)

Thus, the operator can freely select either VFO-F1 or F2 by a simple switching operation and can use the transceiver in the simplex mode. Especially, it is no problem that the bands and modes are different from each other. Thus, this is a very convenient feature.

NOTE

If the transmitting frequency is set out of the amateur bands, the simplex operation is not applicable.

4.5.2 SPLIT Operation

In the split operation, the receiving frequency and the transmitting one are different. The split operation is performed as described below.

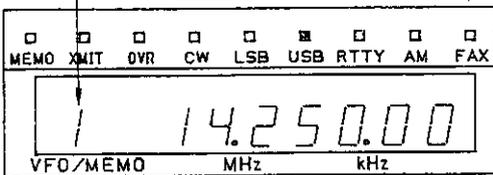
R-F1 and R-F2 switches of VFO SELECT switches (26) change VFOs between reception and transmission. Thus, by depressing R-F1, VFO-F1 is for reception and F2 for transmission. Also, at the VFO/MEMO part on the frequency display (3), "1" for reception and "2" for transmission are displayed. This indicates that VFOs change respectively.

Similarly, by depressing R-F2, VFO-F2 is for reception and VFO-F1 is for transmission. Also, "2" for reception and "1" for transmission are displayed at the VFO/MEMO part on the frequency display. This indicates that VFOs change respectively.

NOTE

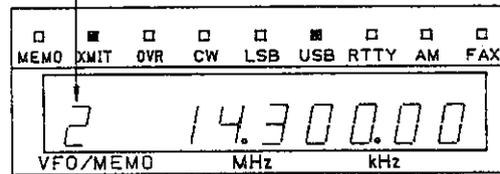
When the mode is different in the split operation, VOX and PTT switch of the microphone can't be used. Change the transmission and reception by using the STANDBY switch (20). When the transmitting frequency is set out of the amateur bands, the split operation is not applicable.

Indicates that VFO-F1 is selected



Reception

Indicates that VFO-F2 is selected



Transmission

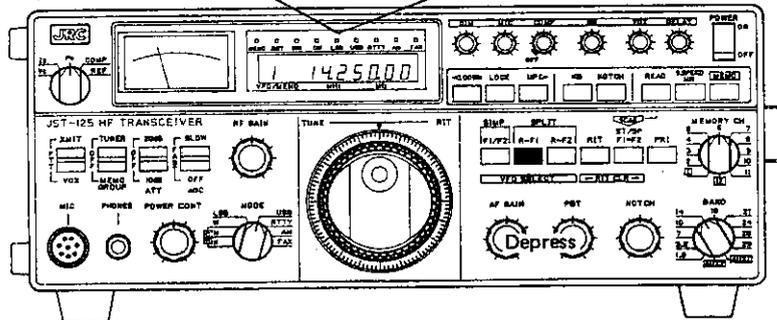


Figure 4.9 Display Example in the Split Operation (R-F1)

4.5.3 F1 = F2 (equalization) function

This function is used to make frequencies and modes of two VFOs F1 and F2 coincident. If F1=F2 switch (28) is depressed when F1 or R-F1 is used, the data of F2 will be erased and changed to F1's.

If this switch is depressed when F2 or R-F2 is used, the data of F1 will be erased and changed to F2's.

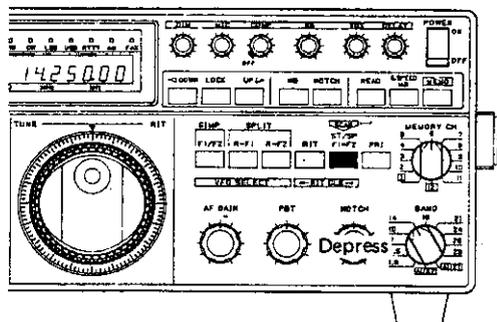


Fig. 4.10 Equalization Switch

4.6 Usage and Application of Memory

JST-125 has 72 channel memories (12 channels x 6 groups (A to F)) which are capable of storing not only frequencies but also the respective modes at the same time. Stored data are backed up by a lithium battery.

The (12) position of the MEMORY CH switch (30) is used as a 12th memory channel. Besides the above, it is also used when controlling the frequency and mode of JST-125 externally.

4.6.1 Storing the Frequencies

To store the frequency into the memory, practice the following.

- (1) Set the desired frequency and mode by using the main dial (25) and MODE switch (33), etc..
- (2) Then, set the desired channel by turning the MEMORY CH switch (30) as depressing MEMO GROUP switch (21). While the MEMO GROUP switch is ON, the content in the memory channel selected by the MEMO GROUP switch and MEMORY CH switch is displayed. But the formerly set frequency will not be erased. To change the group, refer to Paragraph 4.6.2 (B), "READ (Memory read) mode".

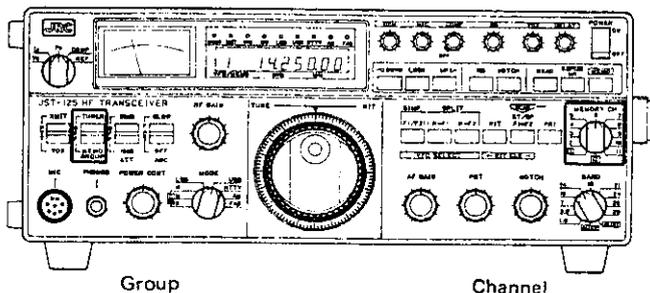


Figure 4.11 MEMO GROUP and MEMORY CH switches

- (3) Then, depress the MEMO switch. MEMO LED on the operation indicators (4) will momentarily lights up to indicate the memory operation has been finished.

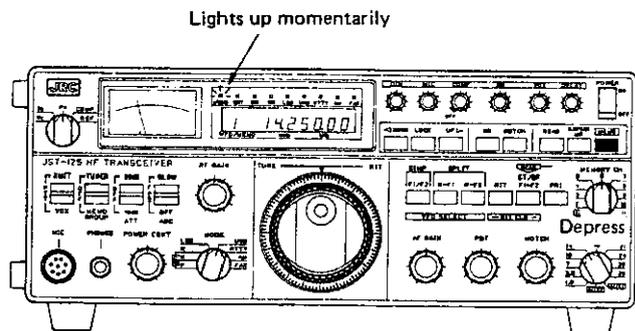


Figure 4.12 Memory Writing

4.6.2 Memory Recall

There are two methods for recalling the memory data as described below.

(A) MR (Memory recall) mode

This mode is used to recall the stored frequency into the working VFO.

At this time, the frequency and mode data of VFO which have been used will be erased and replaced with the memorized data.

- (1) Set the MEMORY CH switch to the channel where the desired frequency data are stored, as depressing the MEMO GROUP switch (21). To change the group, refer to Paragraph 4.6.2 (B), "READ (Memory read) mode".
- (2) Depress the MR switch (13). MEMO LED on the operation indicators (4) will lights up and the frequency data will be recalled. When F1 or R-F1 of the VFO SELECT switches is depressed, the memorized data are recalled into VFO-F1. On the other hand, when F2 or R-F2 is depressed, the data are recalled into VFO-F2. The transceiver operates on that frequency and mode.

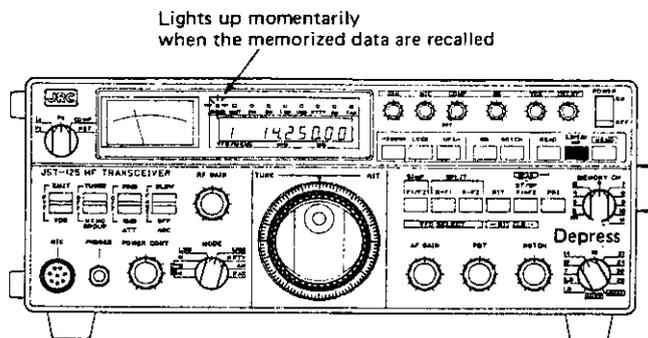


Figure 4.13 Memory Recall Mode

B READ (Memory read) mode

This mode is basically equal to the memory recall mode (A), except that the VFO data are retained even after the stored data is recalled. Thus, the transceiver can be returned to the previous operating conditions by certain operations.

- (1) By depressing the READ switch (14), the frequency data of the channel set by the MEMORY CH switch (30) will be recalled, and the MEMO LED of the operation indicators (4) lights up. Also, the group number is displayed on the left side of the display. Groups are changed cyclically like A → B → C → D → E → F → A by depressing the MEMORY GROUP switch (21).
- (2) Recalled frequency data (both frequency and mode) can be changed by the dial operation. But, during transmission, the frequency can't be changed.

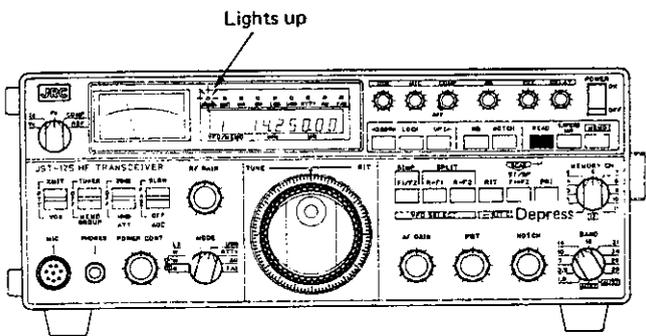


Figure 4.14 Memory Read

- (3) Also, changed frequency data can be stored in the memory again by depressing the MEMO switch (12). At this time, the MEMO LED will momentarily go off to indicate that the new frequency data have been stored. The READ switch is of a lock type. By operating the MEMORY CH (30) and MEMORY GROUP switches (21) while leaving the READ button (14) pressed, the frequency data in the memory channels are read out one after another. This function is very useful for checking the memory content or receiving the stored frequencies one after another.

4.6.3 Automatic Antenna Tuner Operation in READ Mode

Automatic antenna tuner NFG-220 (option) has channel addresses corresponding to each of 72 memory channels of JST-125. Thus, once the best matching for a certain memory channel has been completed by pressing the TUNER switch (2), the best matching condition is given instantaneously when the same memory channel is selected. Namely, without using the TUNER switch (2) again, you can transmit under the best matching condition.

4.6.4 Channels 10 and 11 of the Memory Group F

The frequency data stored in Channels 10 and 11 of the memory group F are set to the positions of AUX1 and AUX2 at the BAND switch respectively. Therefore, these channels are applicable to the unique utilization such as private channel assignments, etc..

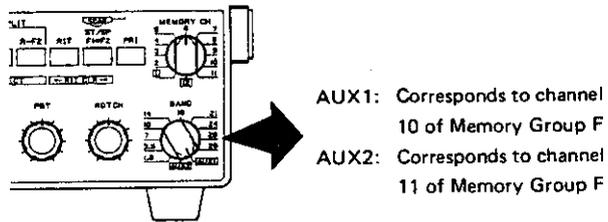


Figure 4.15 AUX1 and AUX2 Positions

4.7 Scanning Functions

The JST-125 can scan the six memory groups A through F for the memory channel selected with the MEMORY CH switch (30). The scanning speed can be also changed.

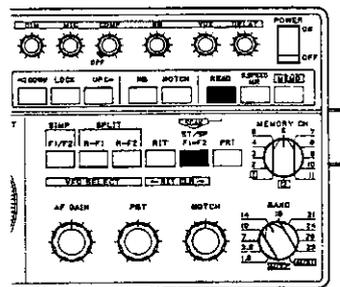
4.7.1 Scanning Start/Stop

Select the desired memory channel with the MEMORY CH switch (30), and press the READ (SCAN) switch (14) to select the MEMORY READ mode.

Press the ST/SP switch (28), so scanning starts, and the memory groups A through F for the selected memory channel can be scanned.

Press the ST/SP switch (28) again, so scanning is stopped.

- ① Set the desired memory channel, and select the memory read mode.



- ② Start/Stop of scanning

Figure 4.16 Scanning Start/Stop

Scanning can be also stopped with the standby switch (20) or the PTT switch on the microphone.

4.7.2 Setting of Scanning Speed

When the MR (S. SPEED) switch (13) is pressed after selecting the memory read mode with the READ (SCAN) switch (14), the frequency display (3) indicates the scan speed in second per channel. Each time the MR (S. SPEED) switch (13) is pressed, 0.5, 1, and 3 seconds are cyclically selected by turns.

- ① Select memory read mode. ② Set scanning speed.

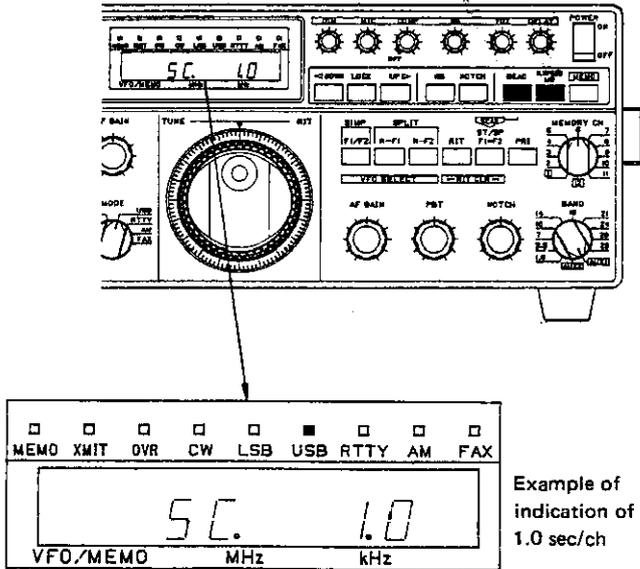


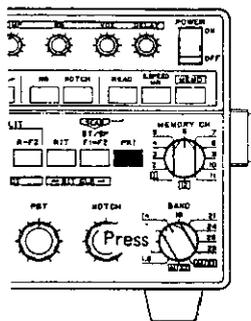
Figure 4.17 Setting of Scanning Speed

4.8 Priority Checking Functions

This function allows privileged reception of a particular memory group or particular memory channel at a fixed interval during the VFO/MEMORY operation or during scanning.

4.8.1 Priority Checking during Scanning

When the PRI switch ⑳ is pressed during scanning, priority is given to reception of a particular memory group (group A) in each scanning operation. To clear the priority checking function, press the PRI switch ⑳ again.



Press the PRI switch during scanning.

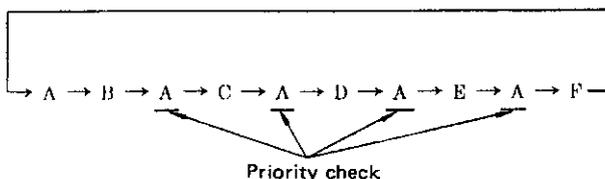


Figure 4.18 Priority Checking during Scanning

4.8.2 Priority Checking during Manual (VFO) Operation

When the PRI switch ⑳ is pressed during the manual (VFO) operation, priority is given to reception of a particular memory channel (CH1 in the group A) for one second once every five seconds. To cancel this function, press the PRI switch ⑳ again.

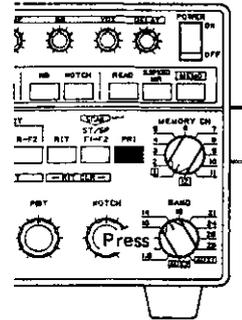


Figure 4.19 Priority Checking during Manual Operation

NOTE

- 1) During transmission, scanning and priority checking cannot be done.
- 2) When the NFG-220 automatic antenna tuner is connected and in some cases, the receiving sensitivity may be reduced in the priority checking during the manual operation.

4.9 Connection of Peripheral Equipments

4.9.1 Electronic Keyer

Connect the electronic keyer by using the supplied key plug as described in Paragraph 2.2.5 and shown in Fig. 2.4. CW keying circuit of JST-125 operates on +5V TTL level. Therefore, the electronic keyer which uses the mechanical contact such as relay etc. in the keying circuit can be used as it is. In case of a keyer that uses semi-conductor keying circuit, choose it such a type that the saturation voltage is less than 0.5V at 2mA sink current when keying down and the resistance is more than 20kΩ when keying up.

CAUTION

Do not apply a voltage over +5V or any negative voltage to the CW keying circuit. Otherwise, the CW keying circuit of JST-125 may misoperate or be damaged.

4.9.2 Linear Amplifier

When connecting a linear amplifier, connect the antenna, earth, standby and ALC lines as shown in Fig. 4.20. Use the linear amplifier which has an input impedance of 50 ohms. In cases other than 50 ohms, connect an antenna tuner between JST-125 and linear amplifier. For the standby signal to the linear amplifier, select either $\overline{\text{BK}}$ OUT line (earth level in transmission) or BK OUT line (open in transmission). ALC input in the ACCESSORY connector on the rear panel is available to adjust the driving level automatically. Either of two terminals ALC \oplus or ALC \ominus can be used according to the polarity of the ALC control. The relation between the ALC voltage and transmitting power is shown in Table 4.3.

	ALC \ominus	ALC \oplus
Operation starting voltage (standard)	* -4V	+4.5V
Operation starting voltage (variable range)	-2.5 - -5V	-
Sensitivity (per 10dB)	0.5 - 1.5V	0.5 - 1.5V

Table 4.3 ALC Control Characteristics

NOTE: *Measured values that the ALC adjusting variable resistor RV7 in the CMB-116B OUTPUT unit is at the center position.

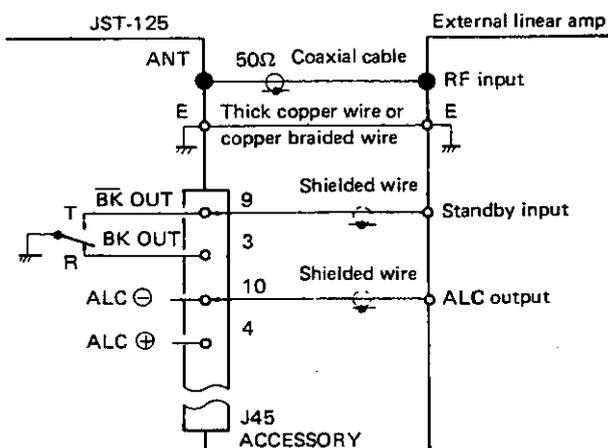


Figure 4.20 Linear Amplifier Connection

4.9.3 Separate Receiver and Receiving Antenna

When using one antenna for this transceiver and a separate receiver at the same time, connect the receiver to the RX ANT jack on the rear panel. At this time, the receiving circuit of JST-125 is connected to the antenna circuit of the separate receiver in parallel. When using the different receiving and transmitting antennas for split operation, connect the receiving antenna to the RX ANT jack after setting the ANT SW S1 placed on CFL-225 BPF unit to OFF.

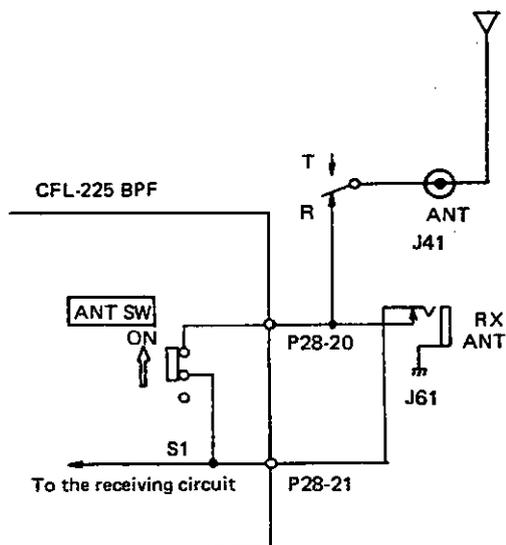


Figure 4.21 Connection of RX ANT Jack on the Rear Panel

4.9.4 RTTY and FAX Devices

To operate the system in the RTTY mode or FAX mode, special peripheral devices must be connected. For examples of connection, see Figs. 4.22 and 4.23.

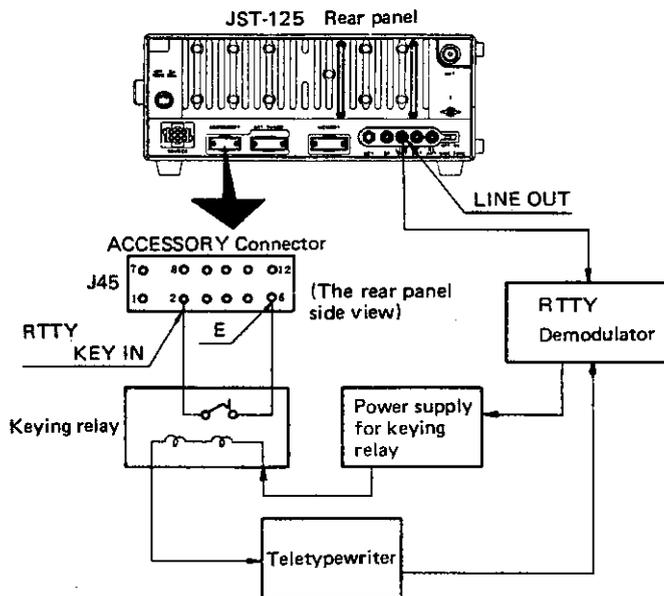


Figure 4.22 Connection of RTTY Device

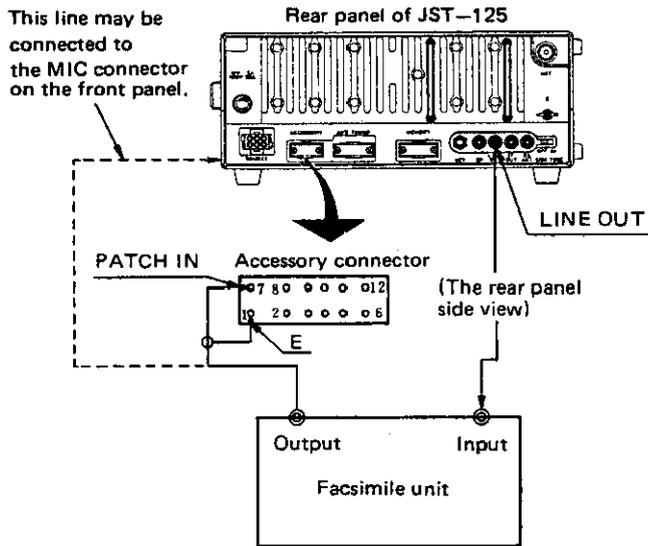
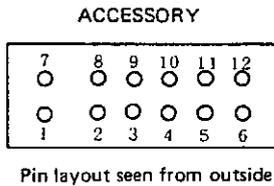


Figure 4.23 Connection of FAX Device

4.9.5 ACCESSORY Connector

ACCESSORY CONNECTOR is provided on the rear panel for combining an external equipment. Pin layout is shown in Fig. 4.24.



Pin No.	Signal name
1	E (PATCH IN)
2	RTTY KEY IN
3	BK OUT
4	ALC ⊕ IN
5	ANTI TRIP IN
6	E
7	PATCH IN
8	XMIT IN
9	BK OUT
10	ALC ⊖ IN
11	SIDE TONE OUT
12	13.8V OUT

Figure 4.24 Accessory Connector

Each signal function is as follows:

①, ⑦ PATCH IN (External microphone input)

These are used when applying the comparatively high level voice signal externally. The input impedance is about 600 ohms. The standard input level is -20dBm, adjustable by the MIC gain control on the front panel.

② RTTY KEY IN (RTTY keying input)

For supplying the keying signal with the TTL level from an RTTY terminal. "L" level is for mark and "H" for space.

⑧ XMIT IN (standby input)

Used for switching the transmitting/receiving mode by an external standby switch. Apply the TTL level signal or a mechanical contact switching information such as a relay or switch. The transceiver becomes receiving condition by the open contact or "H" level, on the other hand transmitting condition by the earthed contact or "L" level.

③, ⑨ BK OUT, BK OUT (Standby output)

Used for switching the transmitting/receiving conditions of external units such as linear amplifier, synchronously with JST-125.

BK OUT: opened in transmission and earthed in reception

BK OUT: earthed in transmission and opened in reception

Both signals are made by relay contacts. Please use them with a resistive or inductive load of less than 0.1A, 100V or 0.5A, 13.8V.

④, ⑩ ALC ⊕ IN, ALC ⊖ IN (ALC control input)

A positive or negative ALC voltage is applied. When the ALC ⊕ voltage exceeds about 4.5V, the power will be reduced. When the ALC ⊖ voltage becomes less than about -4V, the power will be reduced. The ALC ⊖ input impedance is about 100kΩ and the ALC ⊕ input impedance about 100kΩ in SSB and about 1.5kΩ in CW and RTTY modes.

⑤ ANTI TRIP IN (Anti-trip input)

The speaker output signal of the receiver is applied for VOX operation in combination with a separate receiver.

⑥ E (Earth)

⑪ SIDE TONE OUT (Side-tone signal output)

Keying monitor tone is provided in the CW operation. The tone can be switched on and off by the SIDE TONE switch on the rear panel.

⑫ 13.8V OUT (+13.8V output)

+13.8V output. Its maximum current is 1A.

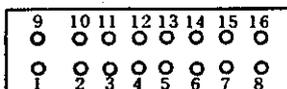
4.9.6 MEMORY Connector

The MEMROY connector on the rear panel is used for remote control with an external device. Connection of the optional RS-232C interface unit NMC-325 to this connector allows remote control of the frequency, mode, etc. with the use of an external device (e.g. a personal computer) having an RS-232C port. For details, see the instruction manual for the NMC-325.

4.9.7 ANT TUNER Connector

The ANT TUNER connector is provided on the rear panel to connect the optional automatic antenna tuner NFG-220. Fig. 4.25 shows each signal of the connector. As for detailed description, refer to Instruction Manual for NFG-220.

ANT TUNER



Pin layout seen from outside

Pin No.	Signal name	Function
1	E	Earth
2	13.8V	+13.8V output
3	BIT 0	Memory address output
4	BIT 1	Memory address output
5	BIT 2	Memory address output
6	BIT 3	Memory address output
7	BIT 4	Memory address output
8	BIT 5	Memory address output
9	BIT 6	Memory address output
10	BIT 7	Memory address output
11	BIT 8	Memory address output
12	R \bar{X}	Split reception control output
13	SIMP	Split control output
14	TUNE ST	Tuning start output
15	PWR REQ	Tuning power request input
16	APC	APC control for tuning

Figure 4.25 ANT TUNER Connector

4.10 Adjustment of Accessory Functions

JST-125 is provided with a number of accessory functions. Some of them require adjustments upon operation. These functions which requires adjustment are ANTI VOX, side tone frequency and level, line output level, ALC, power reduction to 50W and receiving antenna connection.

This section describes these adjustments.

4.10.1 Adjustment of ANTI VOX

The ANTI VOX function is to prevent the transceiver from turning to the transmission in response to the sound from the speaker in the VOX operation.

Adjust the ANTI VOX level to the suitable condition, using a screw driver inserted into the top cover hole.

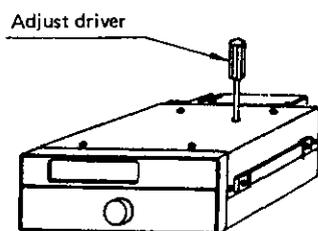


Figure 4.26 Adjustment of ANTI VOX

4.10.2 Adjustment of Side Tone for CW

Remove the upper cover and adjust the variable resistor RV8 (marked "SIDE TONE-F") on the AF AMP unit, CAB-400A, for desired side tone frequency. Refer to the Fig. 4.27.

Adjust RV7 (marked "SIDE TONE") for desired monitor sound level at CW keying.

Removal of the upper cover and layout of the units are described in Section 5 "MAINTENANCE AND CHECK".

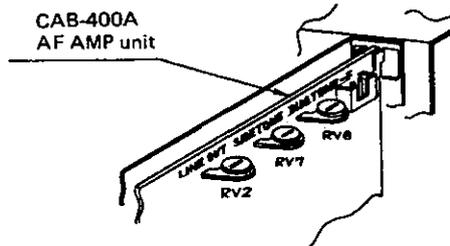


Figure 4.27

4.10.3 Adjustment of Line Output Level

The demodulated AF signal of CW or SSB can be taken out from the LINE OUT on the rear panel with the level of -10dBm.

The output level is adjusted by RV2 (marked "LINE OUT"). Refer to the Fig. 4.27.

4.10.4 Adjustment of ALC

The operation starting level against \ominus ALC signal from the linear amplifier etc. is adjusted.

Adjust the variable resistor RV7 on CMB-116B OUTPUT unit for the optimum level. When the variable resistor RV7 (marked "ALC") is set at the center position, the relation between ALC voltage and the output power is listed in Table 4.4.

NOTE

If the ALC \ominus signal lowers below -8V, the input impedance will decrease to approximately 10k Ω , though usually approximately 100k Ω .

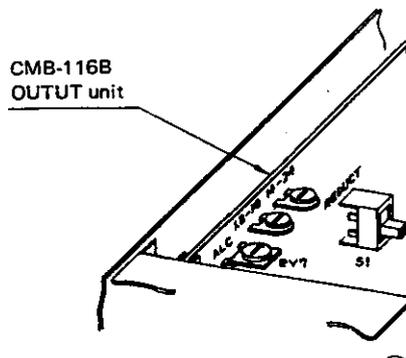


Figure 4.28

ALC voltage	Output power
-3 V	100W
-3.5	100
-4	100
-4.5	50
-5	10
-5.5	2
-6	2 or less

Table 4.4 Relation between ALC voltage and Output Power

4.10.5 Power Reduction to 50 Watts (for JST-125D type)

By changing the REDUCT switch S1 on CMB-116B OUTPUT unit upward, the output power is reduced to 50 watts on all bands from 1.8 to 28 MHz. As for the switch position, refer to Fig. 4.28.

4.11 Special Functions by User Definition

Some of functions can be changed by user definition. The changing method is described below. When the user definition has been accepted, its definition number is displayed at 10Hz digit on the display momentarily.

4.11.1 RIT Range

Under the READ switch (14) ON, if the power switch is turned on as depressing the UP switch (17) and F1 = F2 switch (28) at the same time, RIT range changes to $\pm 200\text{Hz}$. As shipping condition, RIT range has been set to $\pm 20\text{kHz}$ at the factory. To reset it to the original condition, turn on the power switch, setting the same condition as the above.

RIT range	Indication
$\pm 20\text{kHz}$	10
$\pm 200\text{Hz}$	11

(1) (2) ON

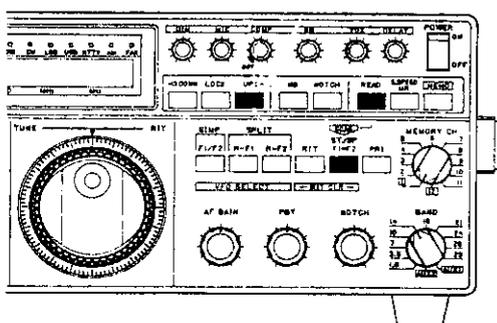


Figure 4.29 Change of RIT Range

4.11.2 Memory of RIT Frequency

Under the READ switch (14) ON, if the power switch is turned on as UP switch (17) and MEMO switch (12) depressed at the same time, RIT frequency will be stored in the memory together with the frequency data. Thus, when the stored frequency data are recalled by the READ switch (14) and MR switch (13) etc., the RIT frequency is also recalled. To reset the definition to the original condition, turn on the power switch again under the same operation. At the factory, the transceiver has been set not to store the RIT frequency.

RIT frequency	Indication
Note memorize	20
Memorize	21

(1) (2) ON

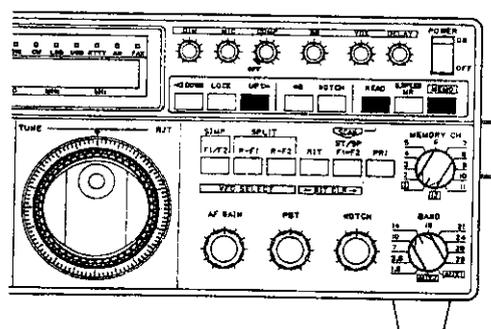


Figure 4.30 Storing the RIT Frequency

4.11.3 "Through" Definition of the Automatic Antenna Tuner

The automatic antenna tuner NFG-220 (option) has the following three modes of "through" operation.

- (A) The tuner is in the "through" mode when the frequency goes outside of the amateur bands.
- (B) The tuner is always in the "matched" mode
- (C) The tuner is always in the "through" mode

At the factory, the transceiver has been set to the condition (A). Whenever MR switch (13) and F1 = F2 switch (28) are depressed at the same time with the READ switch (14) ON, the "through" definition is changed cyclically in order of (A) to (C).

Operation	Indication
"Through" when frequency is out of amateur bands	30
Always matched	31
Always through	32

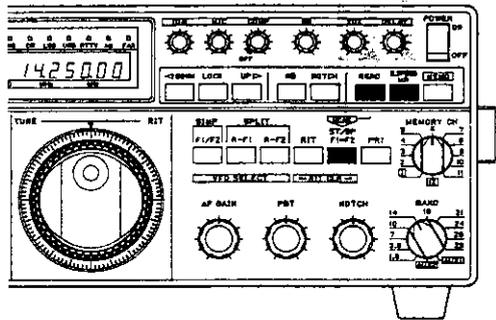


Figure 4.31 Changing the "Through" Definition

4.11.4 Selection of Frequency Display

One of the following methods can be selected to indicate the frequency:

- (A) Indicated frequency shift
When the position of the MODE switch (39) is changed, the indicated frequency is shifted by -1.5KHz in the USB mode, and by +1.5KHz in the LSB mode. At this time, the frequency from the local oscillator is not shifted.
- (B) Local frequency shift
When the position of the MODE switch (39) is changed, the frequency indication is not changed, but the frequency from the local oscillator is shifted by +1.5KHz in the USB mode and by -1.5KHz in the LSB mode.

When the JST-125 is shipped from the factory, it is set at condition (A). To select condition (B), press the READ switch (14), and then turn on the power switch while depressing the F1=F2 switch (28) and DOWN switch (19). To return it to condition (A), practice the same procedure again.

Display mode	Indication
Indicated frequency shift	40
Local frequency shift	41

① ② ON

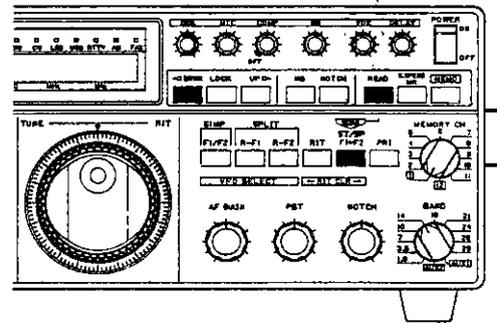


Figure 4.32 Selection of Frequency Display

4.11.5 Selection of Transmitting Operation

One of the following three types of transmitting operation can be selected:

- (A) Frequency is variable during transmission.
- (B) Frequency is unvariable during transmission.
- (C) Transmission is impossible. (Used for reception only)

When the JST-125 is shipped from the factory, it is set at condition (A). To set it at condition (B), press the READ switch (14), and turn on the power switch while depressing the MEMO switch (12) and DOWN switch (19). Each time this procedure is practiced, the JST-125 is set at (A), (B) and (C) cyclically.

Operation	Indication
Frequency variable during transmission	50
Frequency unvariable during transmission	51
Transmission impossible	52

① ② ON

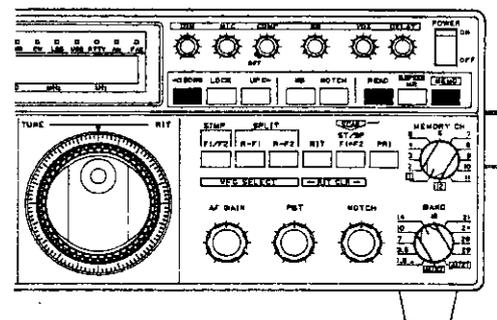


Figure 4.33 Selection of Transmitting Operation

5. MAINTENANCE AND CHECK

JST-125 was completely adjusted and passed the strict quality control at the factory. There is, therefore, no need to readjust before use.

It is, however, important to perform daily maintenance and record the operating conditions during normal operation.

The daily maintenance is helpful to maintain the proper performance of the transceiver. Recording of conditions is useful for detecting failures at the early time. Detailed adjustments other than those described in this chapter requires well trained techniques and sophisticated measuring instruments. If required, please consult the sales office where you bought the transceiver, or JRC.

5.1 Removal of the Covers

Be sure to turn off the power switch and disconnect the power cable, whenever removing the covers for the maintenance, check or adjustment. Then, remove the upper and lower covers as described below. The usual maintenance, check and adjustments can be performed enough under this condition where only upper and lower covers are removed. Do not further disassemble.

- (1) Remove ten screws in order of ① to ③ according to Fig. 5.1.
- (2) As pushing the upper cover backward, hold it up until taken off. (See Fig. 5.2.)

NOTE

The speaker is mounted on the upper cover. Slowly take off the upper cover so as not to break the speaker cable. If necessary, remove the cable connector from the internal PC board.

Now all of the usual maintenance, check and adjustments can be performed under this condition. However, if necessary, in particular, for checking the lower face, remove the lower cover as outlined below.

- (3) Remove four screws according to Fig. 5.3.
- (4) Remove the lower cover in the same manner as shown in Fig. 5.2.
- (5) Note that the interface unit is mounted inside the lower cover.

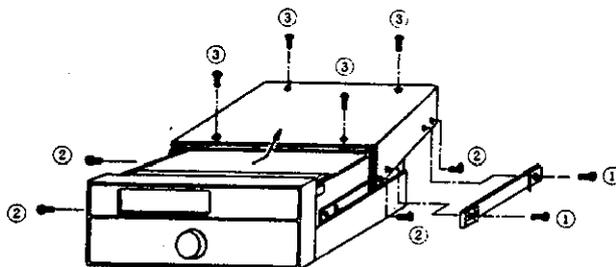


Figure 5.1 Removal of Screws

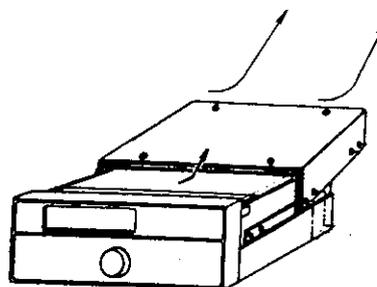


Figure 5.2 Removal of the Upper Cover

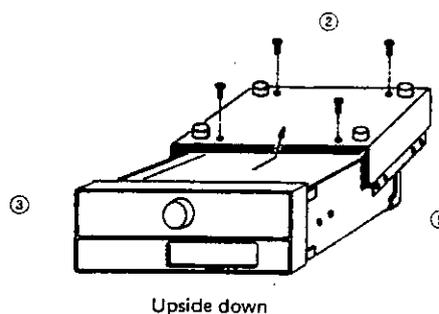


Figure 5.3 Removal of the Lower Cover

5.2 Layout of Units

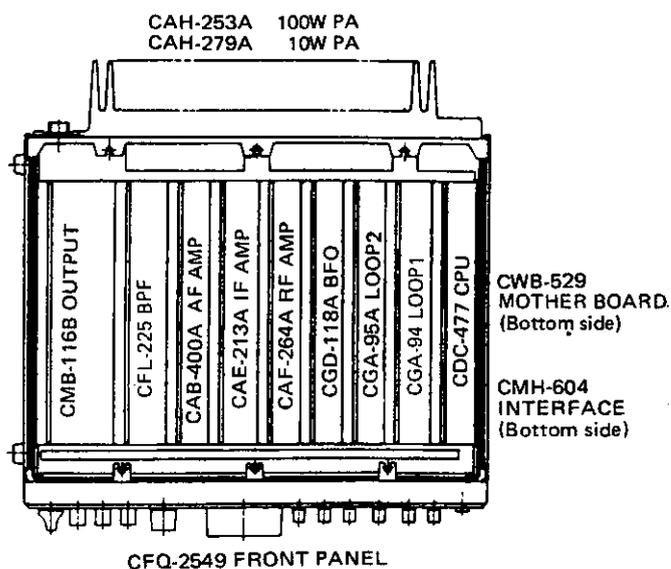


Figure 5.4 Layout of units

5.3 Removal of PC Units

Remove the PC units as shown below.

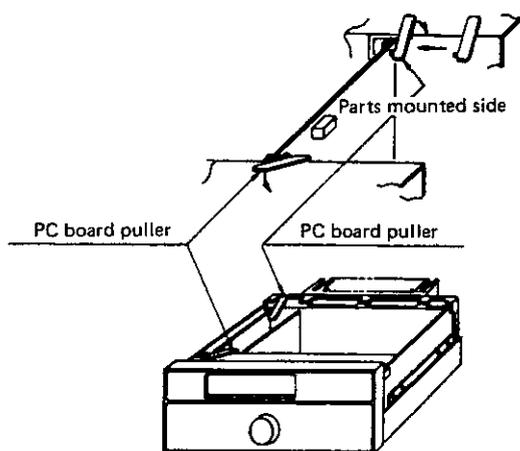


Figure 5.5 Removal of PC Unit

- (1) Insert supplied PC board pullers into two upper corner holes of the PC board from parts mounted side.
- (2) Set the shafts of each puller on the edge of chassis and depress them to pull out the PC board.
- (3) Slowly take out the PC board after the PC board has been disconnected from connectors.

NOTE

Be sure to insert units surely when remounting them again.

5.4 Adjustment of Reference Oscillator Frequency

NOTE

Warm up enough with the upper cover attached, before adjustment.

5.4.1 Adjustment by Using a Frequency Counter

- (1) Remove the upper shielded cover of BFO unit, CGD-118A.
- (2) Connect a frequency counter to TP8 of BFO unit CGD-118A.
- (3) Insert a small driver into the hole (marked "10MHz") on the shield case and adjust the frequency to 10MHz by turning the trimmer capacitor (CV1) in the hole. (Fig. 5.6)

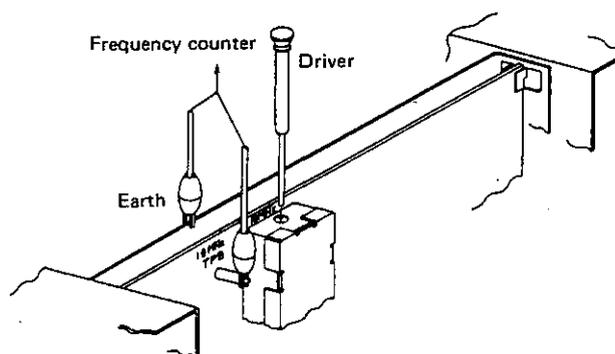


Figure 5.6 Adjustment of 10MHz Reference Oscillator

5.4.2 Adjustment by Using Standard Wave (WWV, etc.)

- (1) Set the receiving frequency to 10.000.00MHz and connect the antenna to receive the standard wave of 10MHz.
- (2) Connect a vinyl-covered wire to TP8 (10MHz) of the BFO unit, CGD-118A, through a capacitor of about $0.01\mu\text{F}$. Bringing the free end of the wire close to the BPF unit, CFL-225, to couple the antenna circuit.
- (3) Adjust the trimmer capacitor CV1 (marked "10MHz") to take a double beat of the internal 10MHz frequency with the standard wave of 10MHz (resonance point).

5.5 Replacement of a Lithium Battery

JST-125 employs a lithium battery for memory back-up. If the stored data in the memory are abnormal or the data can't be stored during operation, the life time of a battery has expired. Thus, replace the battery. The type of the battery is CR-2430FT (manufactured by Sanyo: 3V). When it is hard to buy the battery or you want to ask the battery replacement, please consult the sales office where you bought the transceiver, or JRC.

Replacement procedure of a lithium battery

- (1) Remove the upper cover according to the instruction described in 5.1.
- (2) Remove the CPU unit CDC-477 according to the instructions described in 5.3.
- (3) Replace the old battery with a new one as shown in Fig. 5.7.
- (4) Remount the CPU unit CDC-477 into the right place. At this time, be sure to insert the unit surely.
- (5) Remount the upper cover.

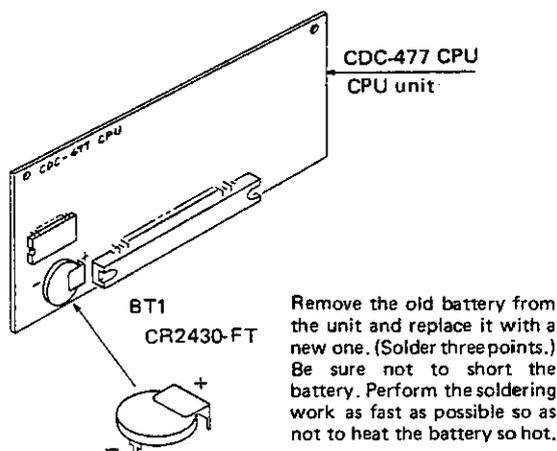


Figure 5.7 Replacement of a Lithium Battery

5.6 WARC Band Transmission

The permission for transmitting in the 18MHz and 24MHz WARC bands depend on each country. This transceiver has been set to receiving only of these bands at the factory. In order to transmit in these frequency bands, remove the jumper wires of JP2 (for 18MHz) and JP3 (for 24MHz) on CWB-529 MOTHER BOARD unit respectively.

— Procedure —

1. Remove the upper and lower covers according to the instruction in 5.1.
2. Remove the jumper wire of JP2 or JP3 on the CWB-529 MOTHER BOARD unit. (Refer to Fig. 5.8.)
3. Remount the upper and lower covers in the reverse order.

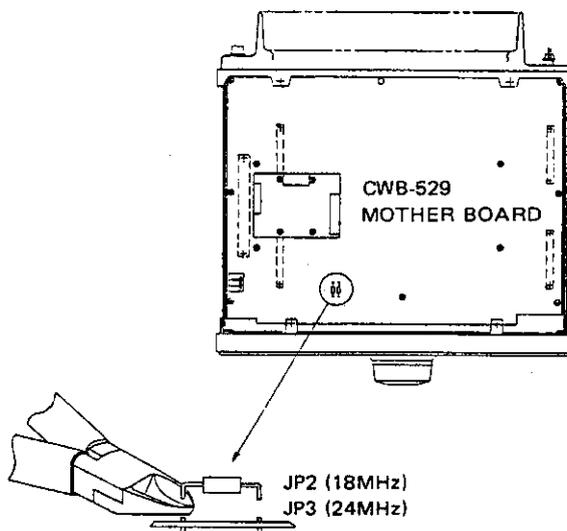


Figure 5.8 WARC Band Jumper Wires

6. TROUBLESHOOTING

Since JST-125 has various functions, the transceiver may not operate as you desire, if operating it incorrectly. Before taking such a case for a failure, read the associated operating procedures in this manual once again.

This chapter describes various symptoms caused by misoperations and mistakes in the installation, handling and operations. Any of these symptoms is not a failure. We hope you will thoroughly investigate them, before asking for repairment. If, however, the transceiver will still not operate normally, investigate the symptom thoroughly and contact with the sales office where you bought the transceiver or JRC.

ASKING A FAVOR OF YOU

Please inform us of the conditions of the trouble as much detailed as possible upon request of a repairment for the best servicing in a short time.

Example:

- Does the failure occur sometimes (once per hour) or continuously?
- Does the failure occur in specific band only or every band?
- Does the failure occur at specific frequencies only or every frequency?
- Does the failure occur in specific mode only or every mode?
- Does the failure occur during the transmitting or receiving or both?
- Is the symptom changed by disconnecting associated peripheral unit?
- Does the failure occur just after power switch on or after a long use?
- Does the failure tend to occur at the hot time or cold time?
- Does the reading(s) on the check meter change, compared with that under the normal condition?
- Is the source power line voltage normal? Is the voltage normal, in particular, in transmission.

6.1 Troubleshooting in Reception

No.	Symptom	Causes	Countermeasure
1	No display and no sound with POWER switch on	(1) Poor connection at SOURCE connector (2) Fuse blown (3) Poor connection at AC Power supply connector (4) Fuse of AC power supply blown (5) Reversed polarity of DC power supply	(1) Check the connection at the connector. (2) Investigate cause and then replace with new fuse with the same capacity. (If it blows again, a failure has occurred. Ask for a repairment.) (3) Completely insert the connector. (4) Same as (2). (5) If the power supply polarity is reversed, the power will not be ON. Connect the blue wires of the DC power cable to the (-) terminal.
2	With POWER switch on, the frequency display works, but no sound	(1) Headphones is connected to the PHONES jack. (2) The transceiver is in the transmitting condition with the standby switch set to XMIT. (3) AF or RF GAIN controls are set to fully counter-clockwise position.	(1) Disconnect the headphones. (2) Set the standby switch to PTT. (3) Adjust them for desired sound volume.
3	Dim meter illumination, frequency display and LEDs	The DIM control is set to the minimum position.	Set the control for desired illumination.

No.	Symptom	Causes	Countermeasure
4	Poor receiver sensitivity and low reading on the S-meter	(1) The ATT switch is set to 10dB or 20dB (2) No antenna is connected or the antenna wire is broken on the way.	(1) Set this switch to OFF. (2) Check the coaxial cable.
5	Poor receiver sensitivity and high reading on the S-meter	The RF GAIN control is set too low.	Rotate the control clockwise to increase the RF gain.
6	Poor SSB receiving sound	(1) The NOTCH switch is set to ON. (2) The AGC switch is set to OFF. (3) The NB control is set to fully clockwise position. (4) The PBT control is deviating from the mid position. (5) Wrong mode switch position.	(1) Set the NOTCH switch to OFF or set the notch frequency to interfering beat. (2) Set the AGC switch to SLOW or FAST. (3) As rotating the NB control counterclockwise, set it for low noise without distortion of sound. (4) Set the PBT control to the mid position (center click). (5) Set to the MODE switch to USB or LSB according to the receiving frequency. CW or RTTY position does not provide correct demodulation of the SSB signal because the carrier point for demodulation is different.
7	Extremely high or low cut in SSB or CW reception	Wrong setting of the PBT control	Set the PBT control to the mid position (center click) except when suffering from interference.
8	No frequency change by rotating the main dial. No frequency change by depressing UP or DOWN switch	The dial lock switch is depressed.	Depress the switch once again to clear the lock condition.
9	Impossible to receive with the MODE switch set to CW-M or CW-N position	To receive the signal in CW-M or CW-N mode, optional CW filter is required.	For CW-M, use optional filter of 600Hz, CFL-260. For CW-N, use optional filter of 300Hz, CFL-230.

6.2 Troubleshooting in Transmission

No.	Symptom	Causes	Countermeasure
1	No output power with the standby switch to XMIT	(1) The POWER CONTROL is set to the minimum position. (2) The transmitting frequency is out of the amateur bands. (3) The BAND switch is set to 18 or 24MHz. (4) The frequency indicator displays 0.00kHz.	(1) Rotate the knob clockwise to increase the power. (2) Change the frequency to within the amateur bands. (3) Refer to 5.6. (4) The transmission is impossible when frequency data are not stored in the memory.
2	No output power in the SSB mode	(1) The MIC gain control is set to the minimum position. (2) Poor microphone or poor contact of the microphone connector	(1) Rotate the MIC gain control clockwise for the desired level. (2) Check the microphone.

No.	Symptom	Causes	Countermeasures
3	Impossible to transmit by keying down in the CW mode	(1) The standby switch is set to PTT. (2) The key plug is not inserted correctly into the KEY jack.	(1) Set the standby switch to XMIT or VOX. (2) Insert the key jack surely.
4	Low final stage collector current and high reading of REF on the meter during transmission Low output power	(1) The antenna is not connected or is grounded. (2) SWR of the antenna is high.	(1) Check the antenna system. (2) Adjust the antenna system to lower the SWR or use another antenna tuner (for example, NFG-97 or NFG-220).
5	Poor SSB sound in transmission	(1) The distortion is caused in the SSB balanced modulator by too high microphone input level. Overmodulation indicator OVR LED continuously is lighting. (2) Too high compression level when using the speech processor.	(1) Reduce the MIC gain until the indicator scarcely lights up. (2) Check the compression level on the meter and adjust it for about 10dB.

6.3 Troubleshooting for Frequency Control

No.	Symptom	Causes	Countermeasures
1	Blinking "E" at 1kHz digit when turning ON the power switch.	An error in the memory data exists in the microcomputer.	Replace the lithium battery for the memory back-up with a new one. (Refer to 5.5) The transceiver is initialized automatically after "E" blinks four times. After initialization, F1 and F2 data are set to 7.000MHz, CW mode. Also, all of user's memory data are cleared to 0.00kHz, CW mode.
2	Mode, frequency and/or band are different between transmission and reception	The VFO SELECT switch is set to split R-F1 or R-F2.	Set the VFO SELECT switch to simplex F1 or F2.
3	Receiving and transmitting conditions are repeated automatically while depressing PTT switch on the microphone.	The split mode is selected.	In case of using the transceiver in the split mode, change the transmission and reception by the standby switch on the front panel.

7. OPTIONS

7.1 Peripheral Equipments and Optional Parts

■ NFG-220 Automatic Antenna Tuner

This automatic antenna tuner is the idealistic full-automatic antenna tuner which allows to operate in all bands with one antenna. The matching can be performed by one-touch and this water-proof tuner can be installed at any place.

Frequency range	1.8 ~ 30MHz
Maximum input power	200W PEP
Matching range	Resistance $5\Omega \sim 1k\Omega$ Capacitance 200PF or more
Input SWR	1:1.5 or less (depending on the used antenna)
Tuning time	2 to 4 sec. typical (max. 10 sec. or less)
Input voltage	13.8V DC $\pm 15\%$
Current drain	1.5A or less
Dimensions	200(265) \times 150(153) \times 300 (365)mm (W \times H \times D) Dimensions written in () include protuberances.
Weight	Approx. 5kg
Supplied accessory	CFQ-2304-20 Control cable (16P, 20m)

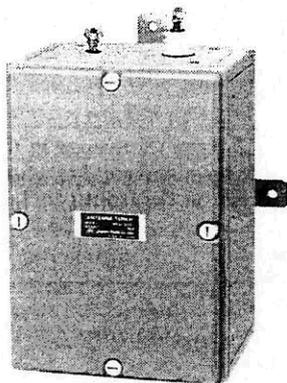


Figure 7.1 NFG-220

■ NFG-97 Antenna Tuner

This antenna tuner is composed of a matching circuit with measuring circuits.

The matching circuit converts an antenna impedance of high SWR into 50 ohms. The measuring circuits measures SWR, forward power and reflected power.

This tuner has independent selectable positions of 10MHz, 24MHz, and 18MHz for the WARC bands.

Frequency range	1.8 ~ 29.7MHz amateur band and through (WARC bands included)
Maximum input power	200W CW (1.8MHz band: 200WPEP)
Matching range	VSWR 1:3.0 at maximum (Unbalanced)
Input impedance	50 ohms
Power measurement	200W/20W/2.5W full scale (Both forward and reflected power)
VSWR measurement	1:10 at maximum
Dimensions	180(W) \times 130(H) \times 273(D) mm
Weight	Approx. 3.3kg



Figure 7.2 NFG-97

■ NBD-500G/U AC Power Supply

NBD-500G/U is a high performance AC power supply for operating the JST-125 on AC power source. This AC Power Supply has been designed to optimize proper performance of the transceiver, while taking account of safety, in addition to the appearance design matched to JST-125 transceiver.

Input	NBD-500G: 220V AC $\pm 10\%$ 50/60Hz single phase NBD-500U: 120V AC $\pm 10\%$ 50/60Hz single phase
Output	+13.8V DC, 20A (intermittent)
Dimensions	180(W) \times 130(H) \times 273(D) mm
Weight	Approx. 9kg

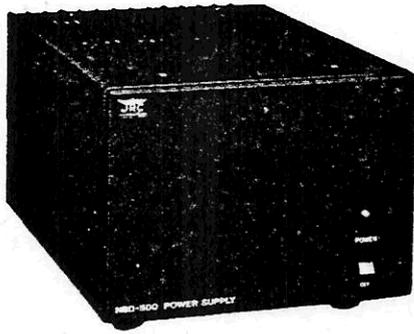


Figure 7.3 NBD-500

■ NVA-88 Speaker

Separate type speaker has been designed to match with the transceiver JST-125.

Input impedance	4 ohms (Nominal)
Maximum input power	3W
Dimensions	180(W) × 130(H) × 273(D) mm
Weight	Approx. 2.5kg

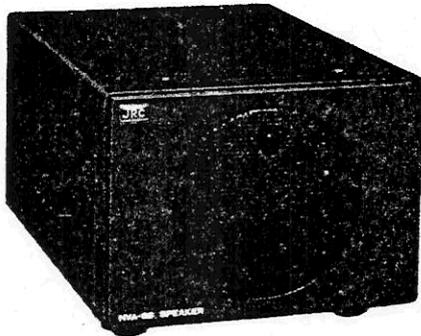


Figure 7.4 NVA-88

■ CHG-43 Desk Microphone

Sensitivity	-73 ±3dB (0dB=1V/μBAR, 1000Hz)
Impedance	600 ohms (Nominal)
Directivity	Non-directional
Weight	Approx. 750g

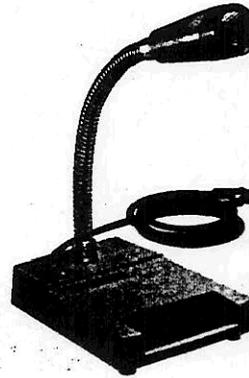


Figure 7.5 CHG-43

■ NVT-57 Hand Microphone

Sensitivity	-70 ±4dB (0dB=1V/μBAR, 1000Hz)
Impedance	600 ohms (Nominal)
Directivity	Non-directional
Weight	Approx. 150g



Figure 7.6 NVT-57

■ NVT-58 Hand Microphone with UP/DOWN Switches

Sensitivity	-70dB ±4dB (0dB: 1V/μBAR 1000 Hz)
Impedance	600 ohms (nominal)
Directivity	Non-directional
Weight	Approx. 150g



Figure 7.7 NVT-58

■ NMC-325 RS-232C Interface Unit

This interface unit allows remote control of the JST-125 with an external device (such as computer) having an RS-232C port.

Signal level RS-232C
 Dimensions 120(W) × 145(H) × 130(D) mm
 Weight Approx. 600g



Figure 7.8 NMC-325

■ KY-3A Morse Key

Dimensions 85(W) × 75(H) × 150(D)mm
 Weight Approx. 900g

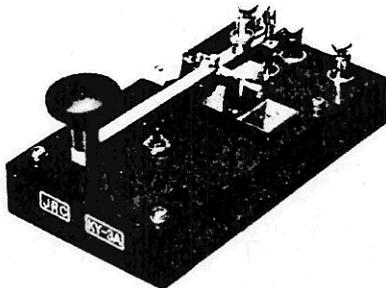


Figure 7.9 KY-3A

■ CFL-260 600Hz Filter

600Hz mechanical filter for CW is used in the CW-M mode. This filter is mounted on the IF AMP unit of JST-125.

Input/output impedance 1kΩ
 Bandwidth 6dB: 0.7kHz
 60dB: 2.3kHz

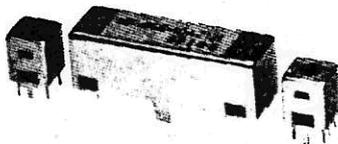


Figure 7.10 CFL-260

■ CFL-230 300Hz Filter

300Hz crystal filter for CW is used in the CW-N mode. This filter is mounted on the IF AMP unit.

Input/output impedance 600Ω/60PF
 Bandwidth 6dB: 0.32kHz
 60dB: 1.4kHz

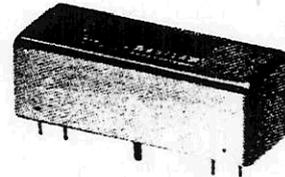


Figure 7.11 CFL-230

7.2 Mounting of Optional Filters

- (1) Take out the IF AMP unit CAE-213A according to the instruction described in Paragraph 5.1 through 5.3.
- (2) Mount the optional filters, CFL-260 and/or CFL-230 on the IF AMP unit as shown in Fig. 7.12, and then solder the filter(s).
- (3) Insert the IF AMP unit into the right place. Be sure to insert the unit surely.
- (4) Before mounting the upper cover, check the correct operation.
- (5) Mount the upper cover.

NOTE: The furnished PC board is not used.

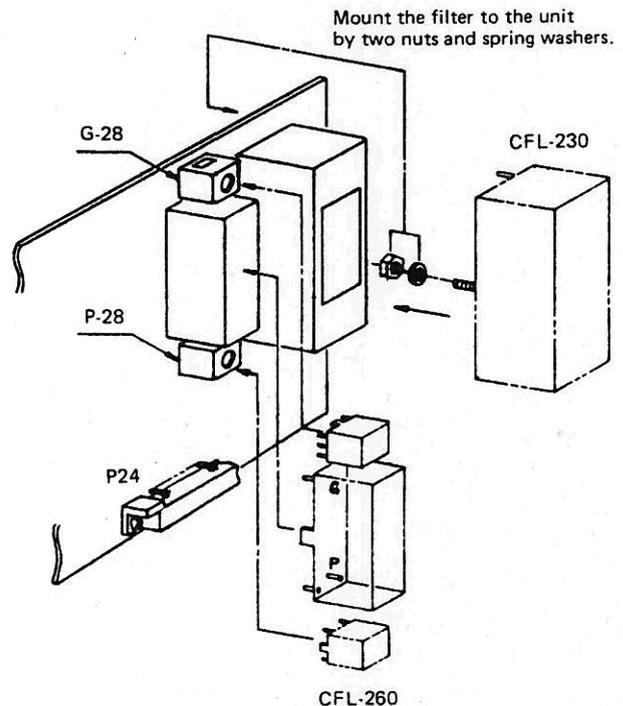


Figure 7.12 Mounting of the Optional Filters

8. SPECIFICATIONS

[General Specifications]

Transmitting Frequency Range	
1.8MHz band	1.8 to 2.0MHz
3.5MHz band	3.5 to 4.0MHz
7MHz band	7.0 to 7.3MHz
10MHz band	10.1 to 10.15MHz
14MHz band	14.0 to 14.35MHz
18MHz band	18.068 to 18.168MHz *1
21MHz band	21.0 to 21.45MHz
24MHz band	24.89 to 24.99MHz *1
28MHz band	28.0 to 29.7MHz

NOTE: *1) For reception only. To transmit, refer to Paragraph 5.6.

Receiving Frequency Range	100kHz to 30MHz
Type of Emission	SSB (LSB, USB) CW AM (Reception Only) RTTY FAX (AFSK)
Frequency Increment	10Hz
Memory Capacity	72 channels (12ch x 6 groups)
Antenna Impedance	50 ohms nominal (Unbalanced)
Input Voltage	13.8V DC \pm 10% Negative grounded
Power Consumption	Approx. 2A (Receiving with no signal) Approx. 20A (Transmitting at 100W output) (JST-125D) Approx. 5A (Transmitting at 10W output) (JST-125S)
Dimensions	330(348) x 130(145) x 273(356)mm (W x H x D) Dimensions written in () include protuberances
Weight	Approx. 10kg

[Transmitter]

Power Output	JST-125D: 10 to 100W (Continuously adjustable) JST-125S: 1 to 10W (Continuously adjustable)
--------------	--

Carrier Suppression	50dB or more
Undesired Sideband Suppression	60dB or more (at 1.5kHz modulation)
Spurious Radiation Intermodulation	-40dB or less 3rd order: -31dB or less (below PEP)
Frequency Response	400 to 2600Hz (within 6dB, SSB)
Frequency Stability	\pm 10PPM or less after 5 to 60 minute warm-up. Within \pm 2PPM per hour, thereafter
Microphone Impedance	600 ohms
Modulation Input Level	-60 to -20dBm required for rated output
Modulation System	SSB, FAX: Balanced modulation RTTY: Reactance modulation
RTTY shift width	170Hz (\pm 85Hz)

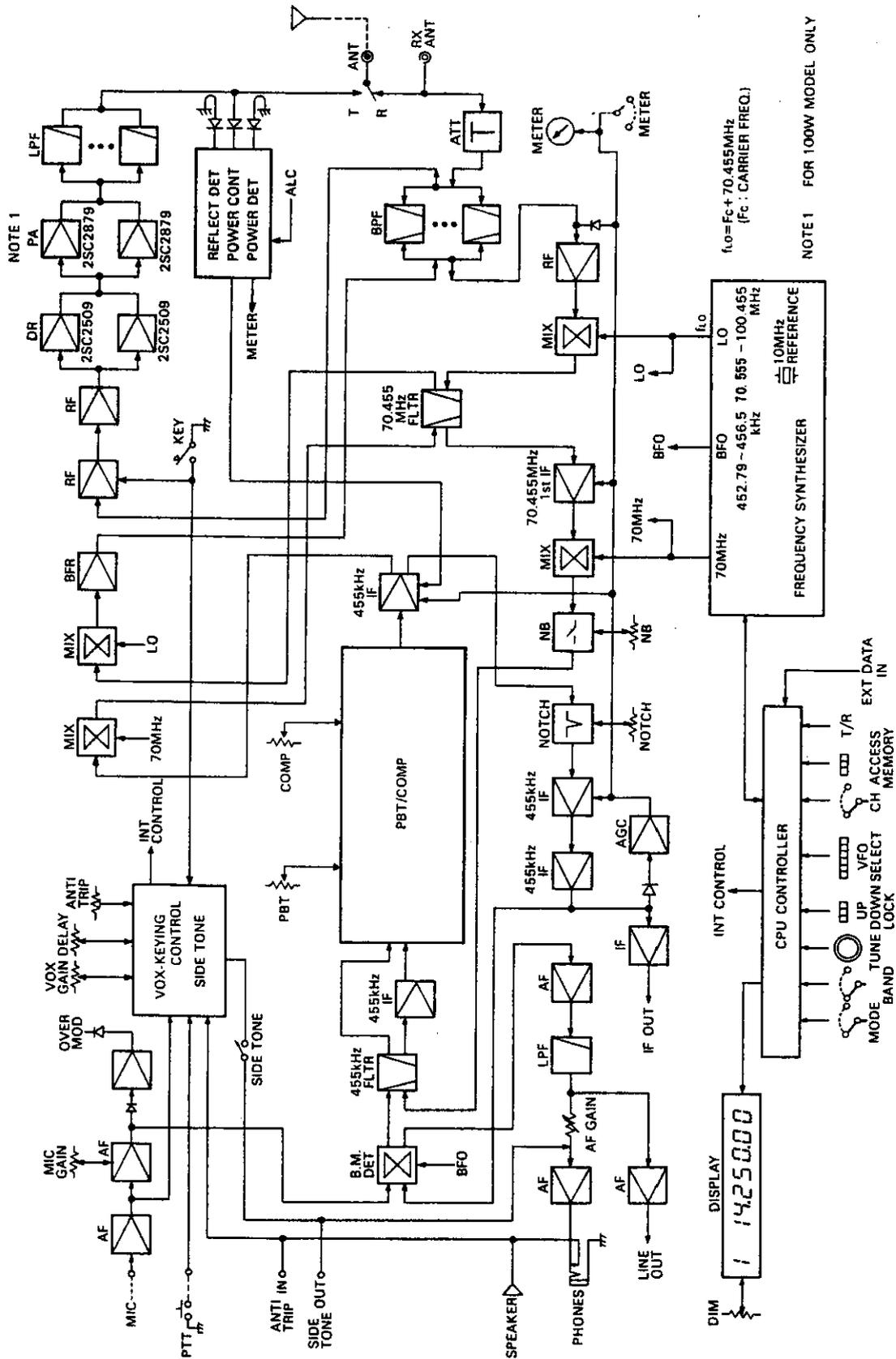
[Receiver]

Receiving System	Double superheterodyne	
Intermediate Frequency	1st IF: 70.455MHz 2nd IF: 455kHz For PBT: 8.7MHz	
Sensitivity (10dB S/N)	SSB, CW, RTTY, FAX AM	
0.1 to 0.5MHz	14dB μ (5 μ V)	24dB μ (15 μ V)
0.5 to 1.6MHz	6dB μ (2 μ V)	16dB μ (6 μ V)
1.6 to 30MHz	-10dB μ (0.3 μ V)	6dB μ (2 μ V)
Image Rejection	70dB or more	
IF Rejection	70dB or more	
Selectivity	-6dB	-60dB
SSB, CW(W), RTTY, FAX	2.3kHz	4.3kHz
AM	6kHz	-
*CW-M	0.7kHz	2.3kHz
*CW-N	0.32kHz	1.4kHz

NOTE: Modes with * are available only when optional filters CFL-260 and CFL-230 are mounted.

RIT Range	\pm 20kHz
NOTCH Filter Attenuation	Approx. 30dB
AF output	1W or more into 4-ohm load with less than 10% distortion

9. BLOCK DIAGRAM



10. CIRCUIT DIAGRAMS

NOTE: Circuit and Components subject to change for an improvement without notice.

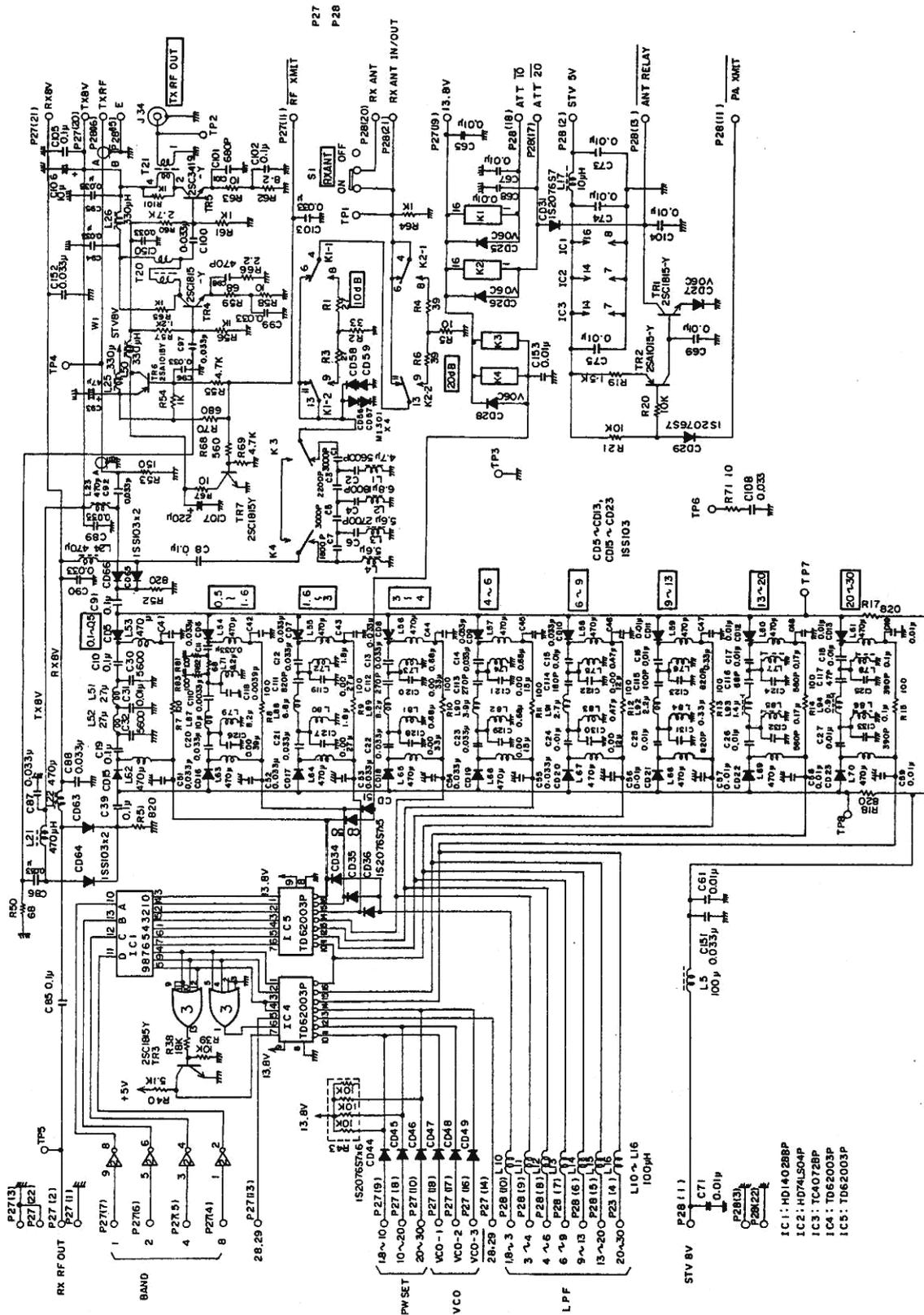


Figure 10.1 CFL-225 BPF Unit

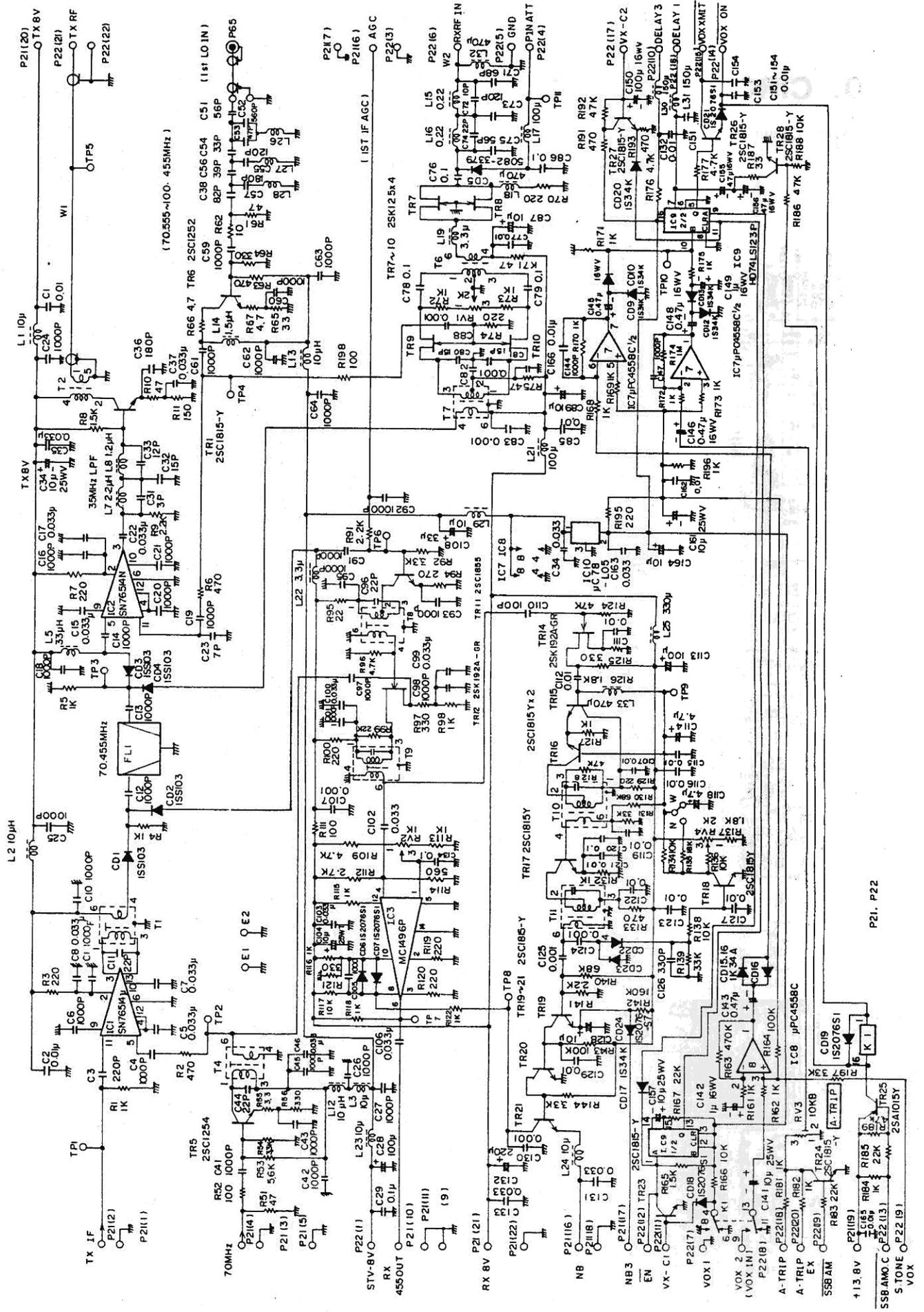


Figure 10.2 CAF-264A RF AMP Unit

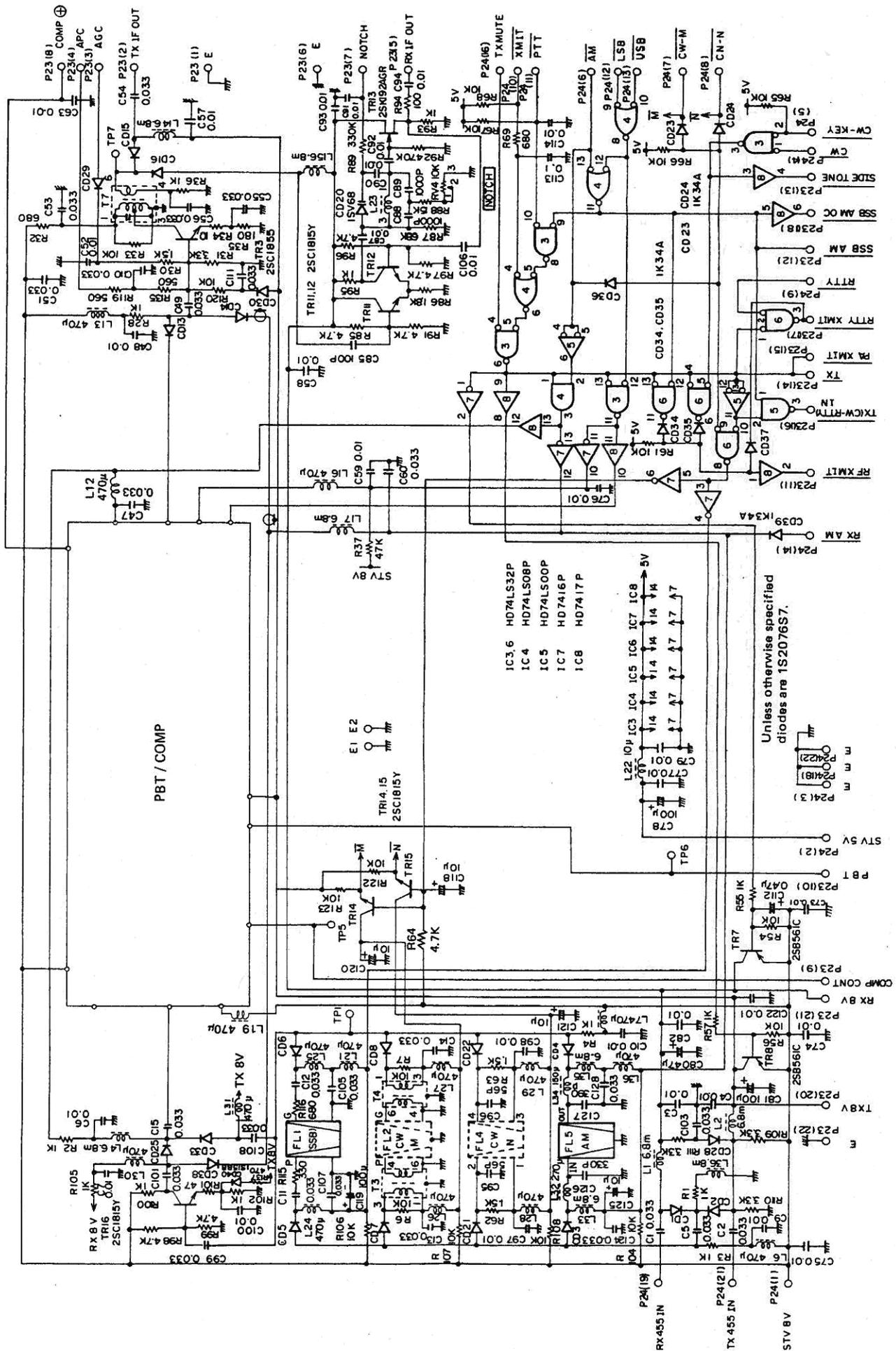


Figure 10.3 CAE-213A IF AMP Unit

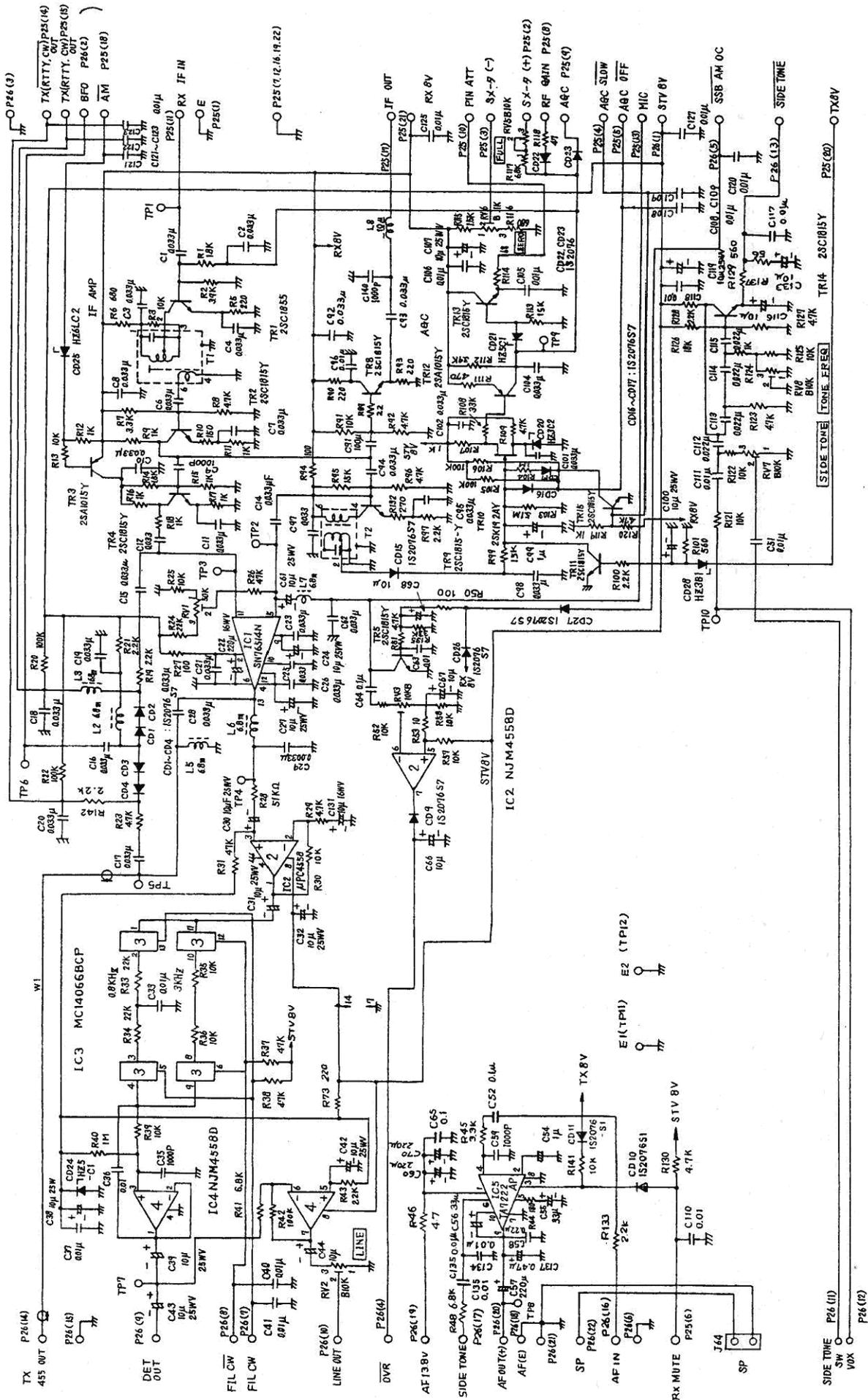
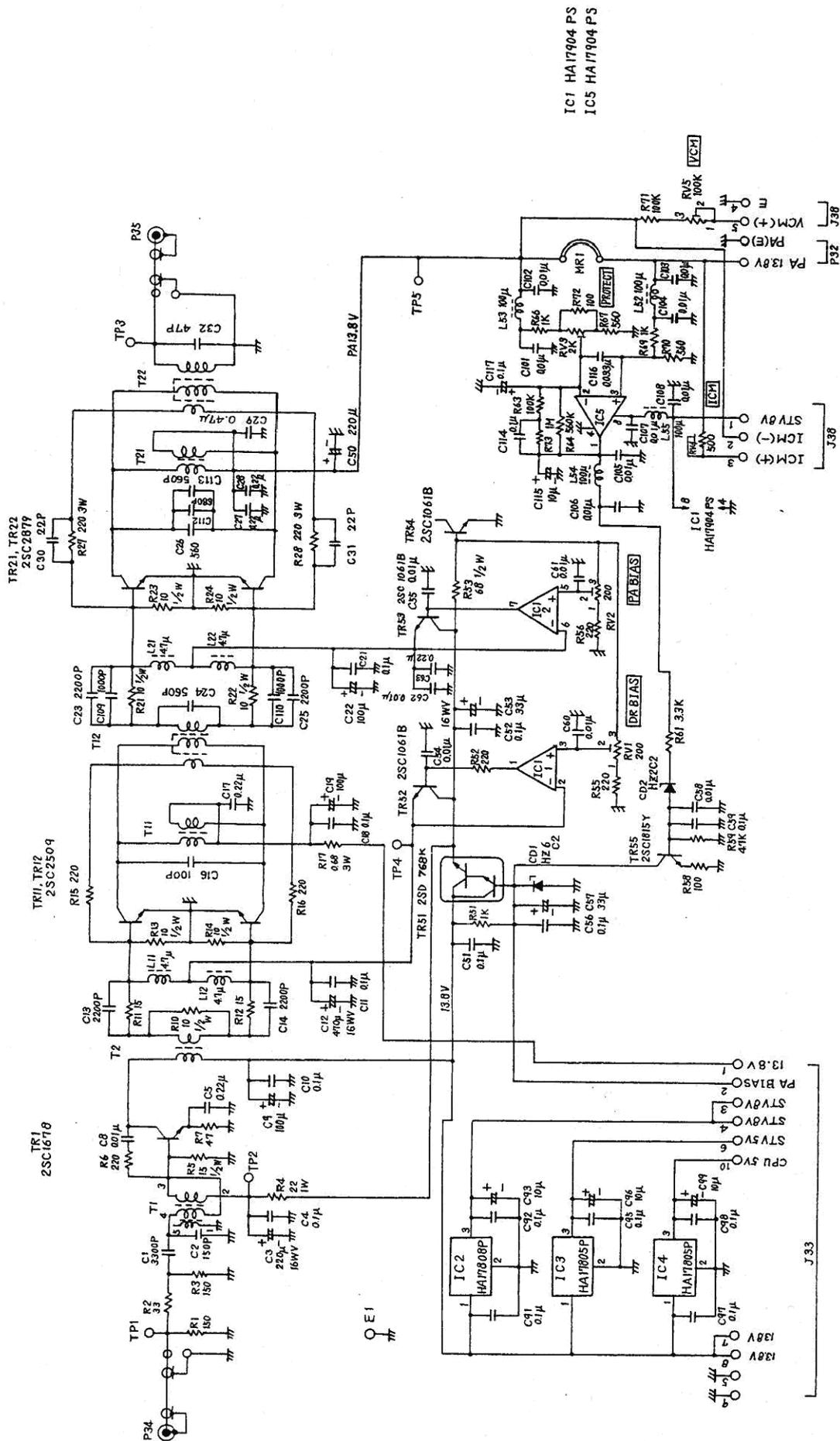


Figure 10.4 CAB-400A AF AMP Unit



IC1 HA17804 PS
IC5 HA17704 PS

Figure 10.5 CAH-253A 100W PA Unit

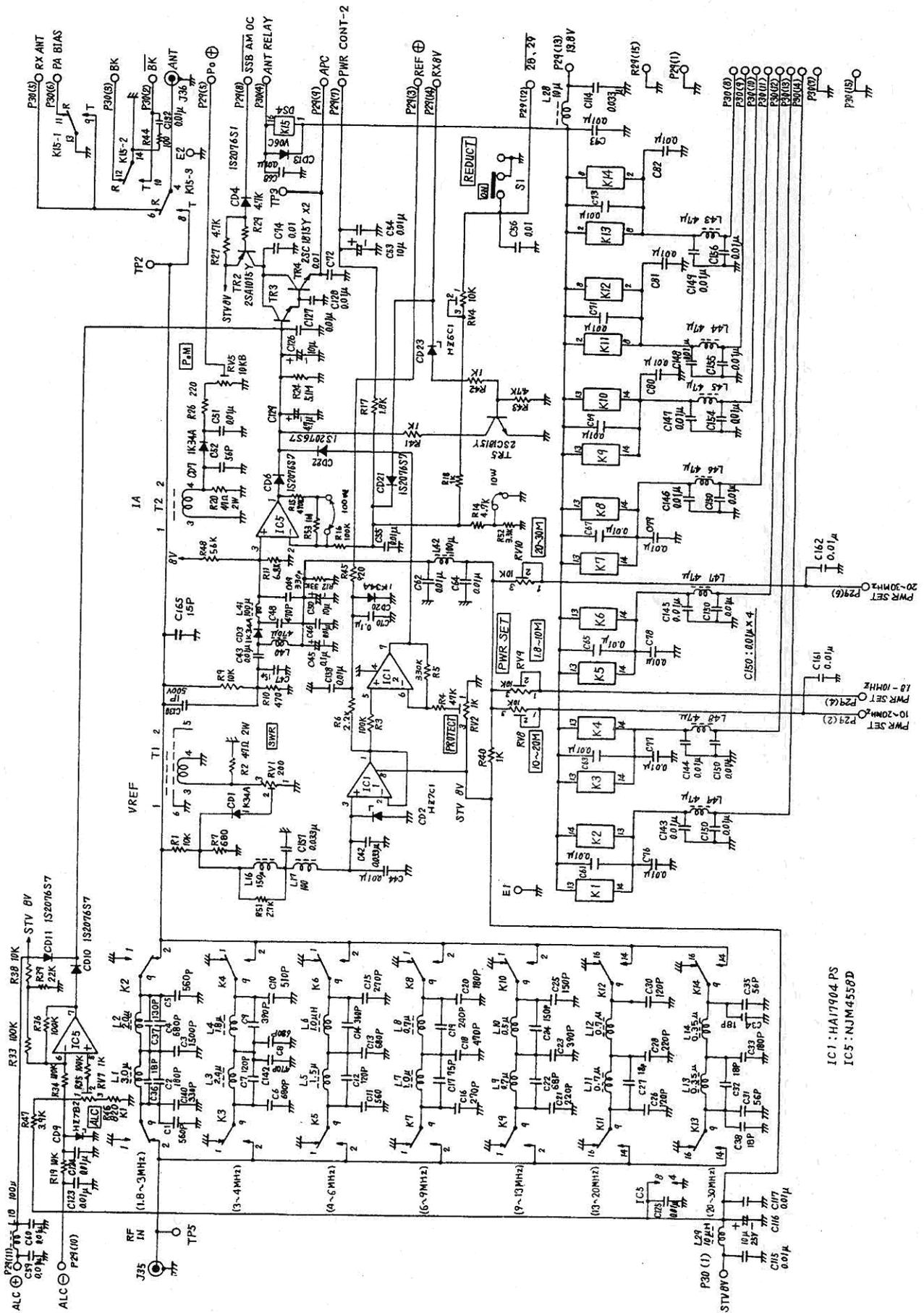


Figure 10.7 CMB-116B OUTPUT Unit

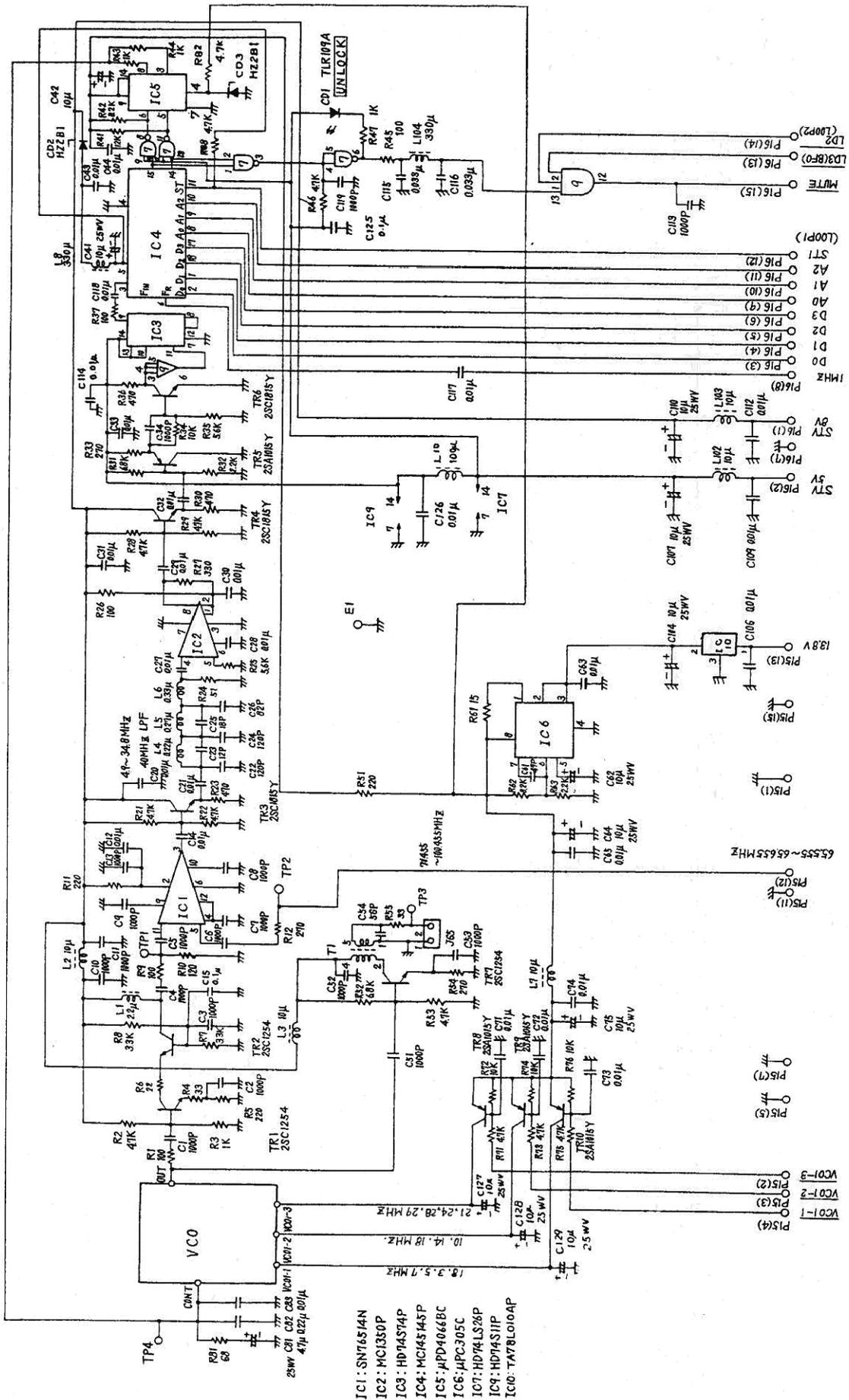


Figure 10.8 CGA-94 LOOP 1 Unit (1/2)

CONT

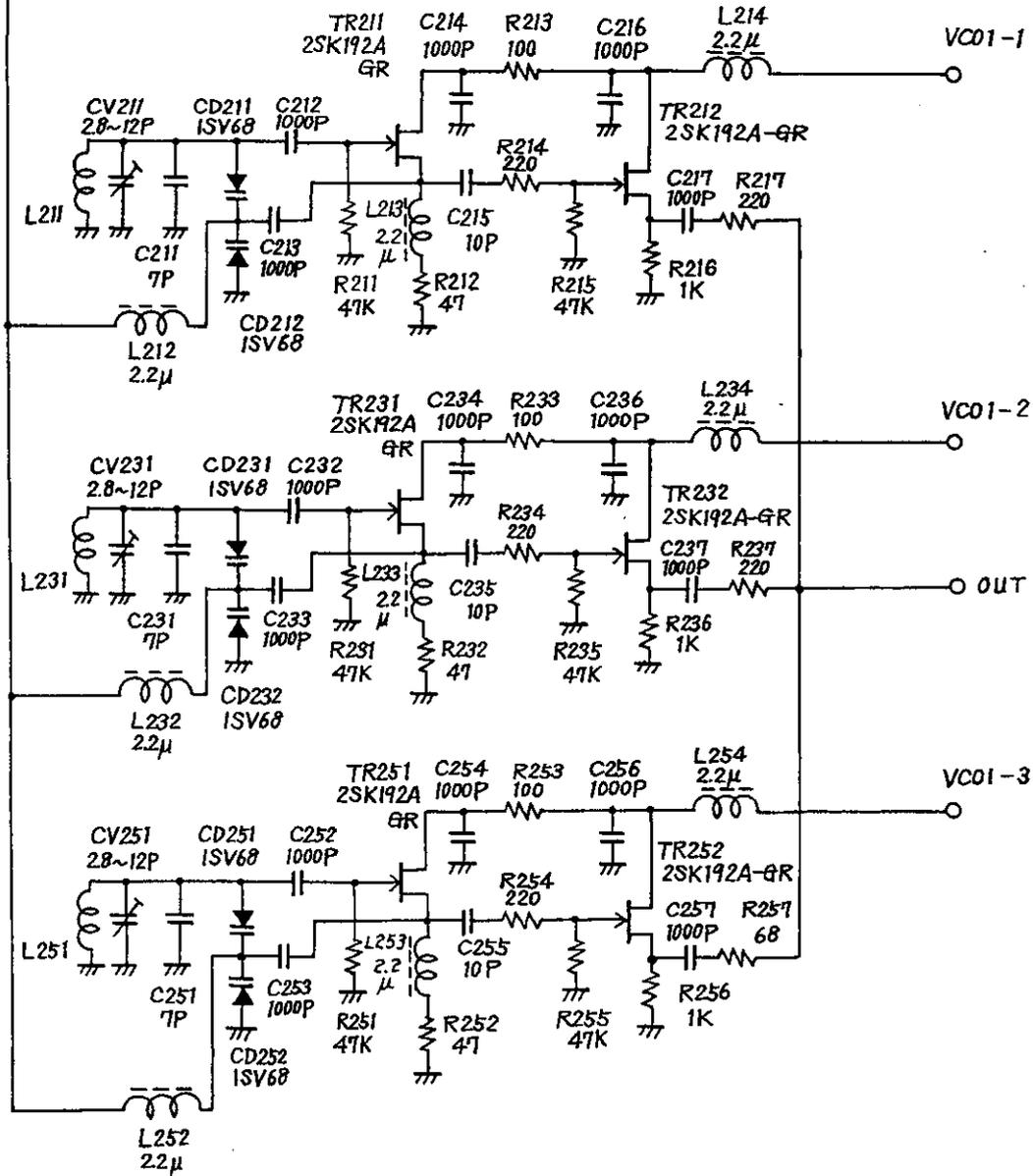


Figure 10.9 CGA-94 LOOP 1 Unit (2/2)

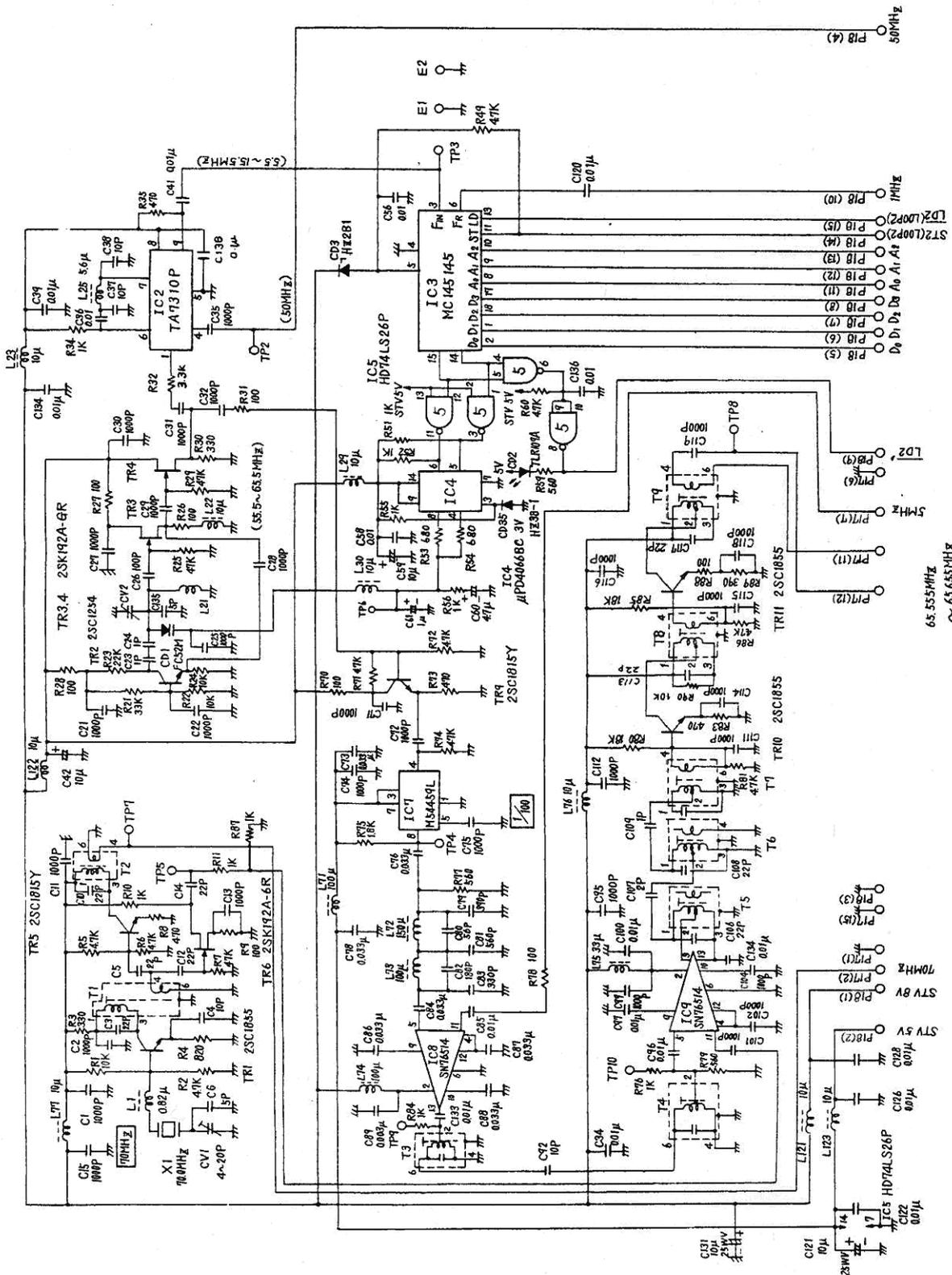


Figure 10.10 CGA-95A LOOP 2 Unit

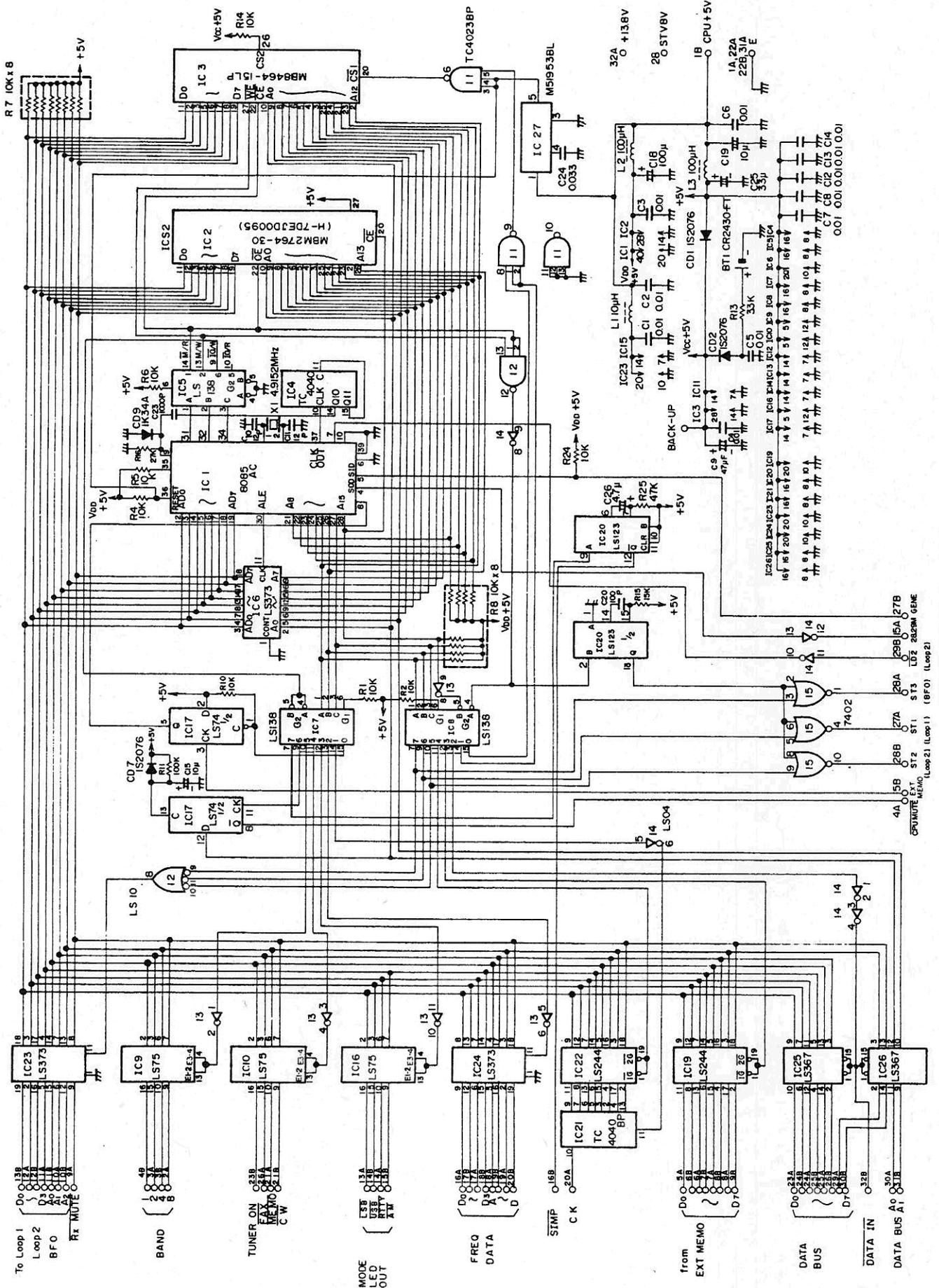


Figure 10.12 CDC-477 CPU Unit

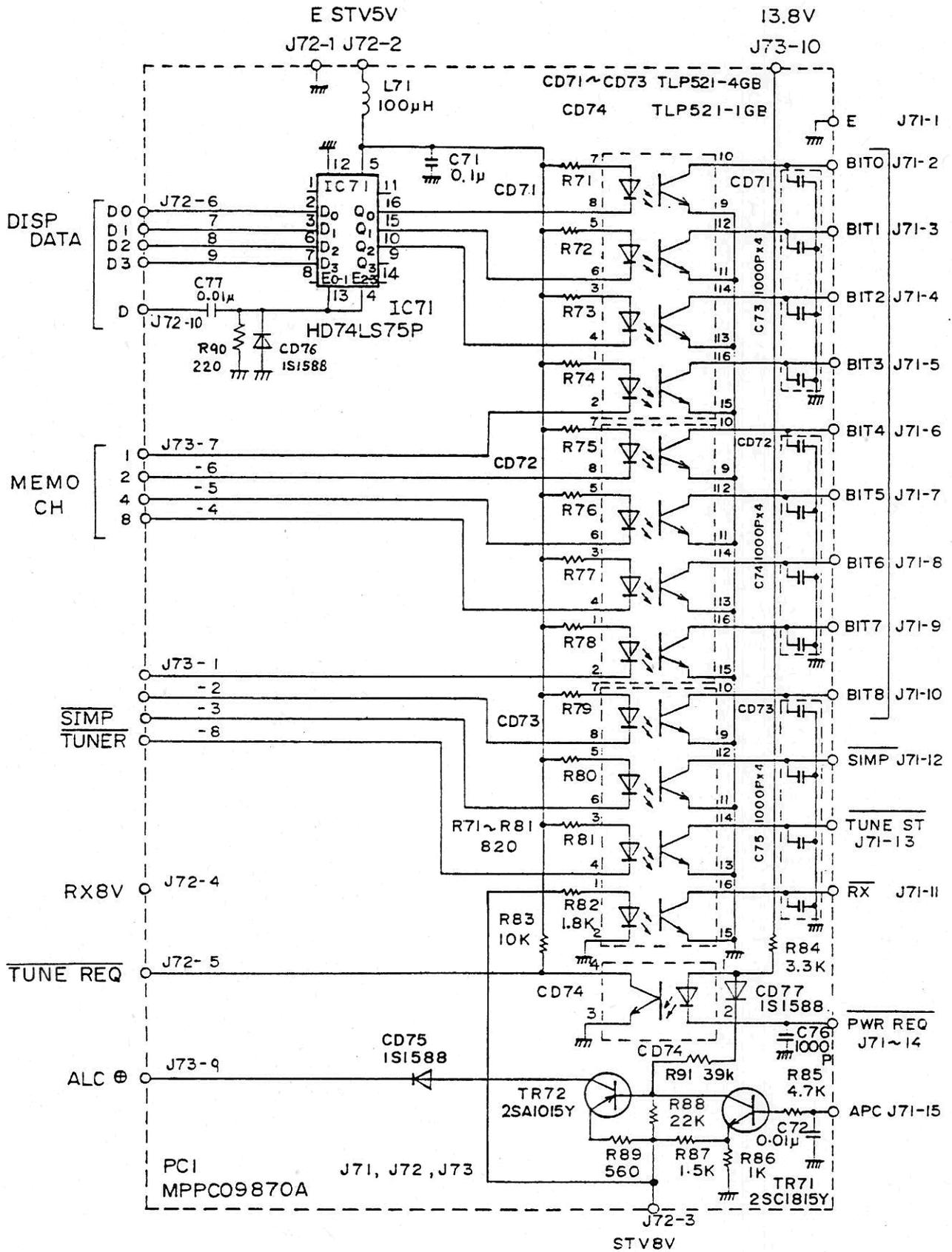


Figure 10.13 CMH-604 INTERFACE Unit

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