
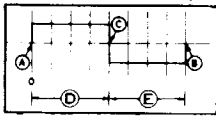
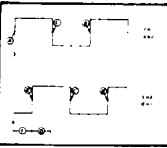
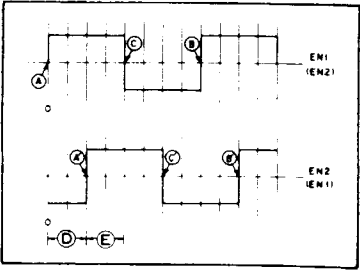


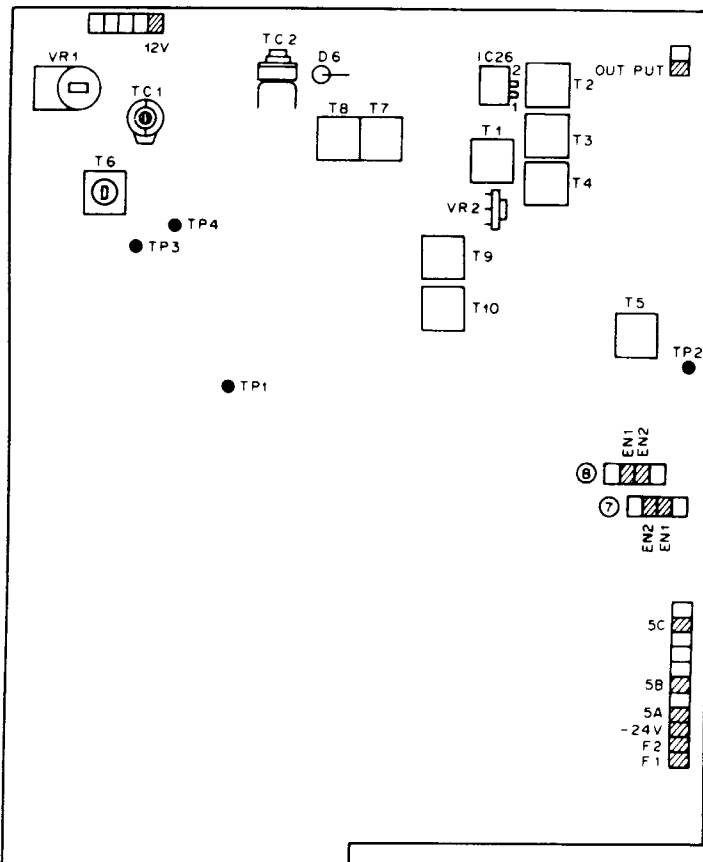
# VFO-230

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
4. RIT adjustment	RIT control: Centered DISPLAY: 500.0	F.counter	Digital	Cathode of D6	Digital	TC1	Adjust so that the frequency counter reading does not change at RIT SW ON/OFF.		
	RIT SW : ON RIT Control: Fully clockwise						Bracketed values are the TS-830S display indication.	More than 5.000 9 kHz (More than 14.500 9)	Check
	RIT SW : ON RIT Control: Fully counterclockwise							Less than 4.999 1 kHz (Less than 14.499 1)	
	RIT SW : OFF							5.000 0 kHz (14.500 0)	
5. CW SHIFT adjustment	TS-830 MODE : TUN VFO-230 RIT : OFF FUNCTION (REC) : VFO	F.counter	Digital	Cathode of D6	Digital	VR1	TS-830 MODE Adjust until a frequency 800 Hz higher than the CW frequency is obtained	800Hz ± 50 Hz	
	TS-830 MODE : CW N STBY SW : SEND VFO-230 RIT : OFF FUNCTION (TRA) : VFO						TS-830 STBY: The frequency is shifted by 800 Hz with respect to REC freq.		
	TS-830 STBY SW : REC								
6. Encoder adjustment	Remove the VFO knob and motor-drive the encoder at approx 300 rpm.	Oscilloscope	Digital	EN 1 terminal of Connectors ⑦ or ⑧					Point C may be located anywhere. When a motor is not available, manually turn the VFO control to check the duty ratio.
	EN 1 duty ratio adjustment: Turn a motor clockwise and counterclockwise.			Encoder	VR1				
	EN 2 duty ratio adjustment: Turn a motor in the both direction.			EN2 terminal of Connectors ⑦ or ⑧	VR2	Adjust until intervals D and E are equal to each other with point C placed at the center.			
	EN1-EN2 phase difference alignment: Same as above.			EN1 and EN2 terminals of Connectors ⑦ or ⑧	Phase adjustment screw		EN1 (EN2): Within 90 deg ± 10% (The difference between clockwise and counterclockwise rotation must also be within this specification.)	The phases of EN 1 and EN 2 may be replaced with each other as indicated in the brackets.	
								Adjust until intervals D and E are equal to each other (point A on EN2 is located in the middle of points A and C on EN1.)	

# VFO-230 PARTS LAYOUT/AC VOLTAGE CONVERSION

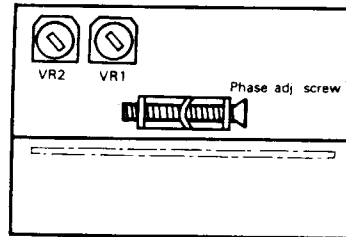
Item	Condition	Measurement			Adjustment		Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts		
7 Beat adjustment	TS-830 AGC FAST RIT OFF RF ATT OFF VBT NORM IF SHIFT Centered MODE USB						Adjust the SSG output frequency until a maximum S-meter reading is obtained on the TS-830S	
	VFO-230 FUNCTION (REC) VFO DISPLAY (Dial) 20.0 Connect the SSG output to the ANT terminal on the TS-830S							
	Adjust the SSG attenuator until the S meter on the TS-830S indicates 20 dB							
	Set the VFO-230's dial to 20.8 (zero beat)	Obtain a beat from the TS-830		Digital	VR2	Adjust to the minimum beat level		
Turn the dial on the VFO-230 from 0.0 to around 50.0 while listening to the signals							An abnormal beat should not be heard	Check

## ▼ DIGITAL UNIT (X54-1570-00)



DISPLAY TUBE

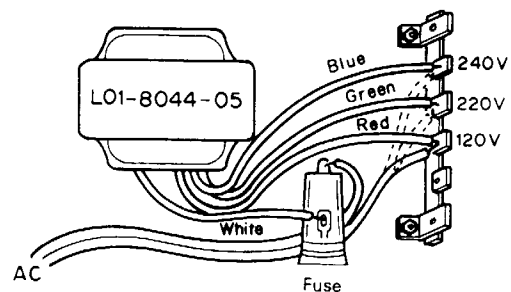
## ▼ ENCODER UNIT (X54-1580-00)

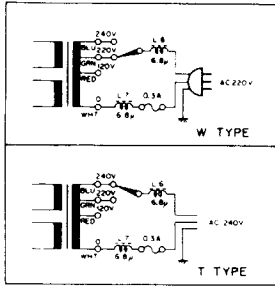


## VFO-230 (K) AC Voltage conversion

To operate the VFO-230 (K) on 240V AC, the power transformer primary tap must be rewired from 120V to either the 220V or 240V tap.

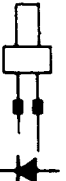
1. Unplug the AC power cable and VFO interconnecting cable.
2. Remove the top cover.
3. Move the AC line from the 120V (Red) to either the 220V (Green) or 240V (Blue) transformer winding.
4. Change the AC fuse from 0.5A to 0.3A. Tag the power cord at the back of the unit to indicate that the transformer is wired for 240V AC, and the power fuse should be 0.3A and not 0.5A.
5. Replace the top cover and cable up to verify your work.





- Q1 : 2SD880(Y)      D1,7,8,13,14    1S1555      D15~17 : TLR-205
- Q2,4~6 : 2SC1815(Y)    D2~5,9,10,12    V06B        D18 : SLP-144
- Q3 : 2SA496(Y)        D6 : WZ-150      D19 : XZ-049
- IC1 : μPC14305H
- IC2 : TA78L012AP

SLP-144



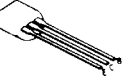
TLR-205



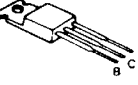
2SA496(Y)



2SA1015(Y)  
2SC1775(E)  
2SC1815(Y)  
2SC1959(Y)



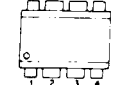
2SD880(Y)



3SK73(GR)



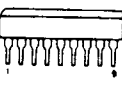
LM358P  
SN16913P



TA78L012AP



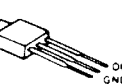
TC5081P



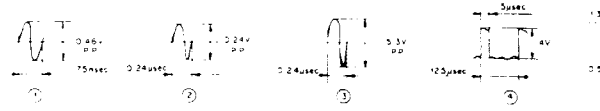
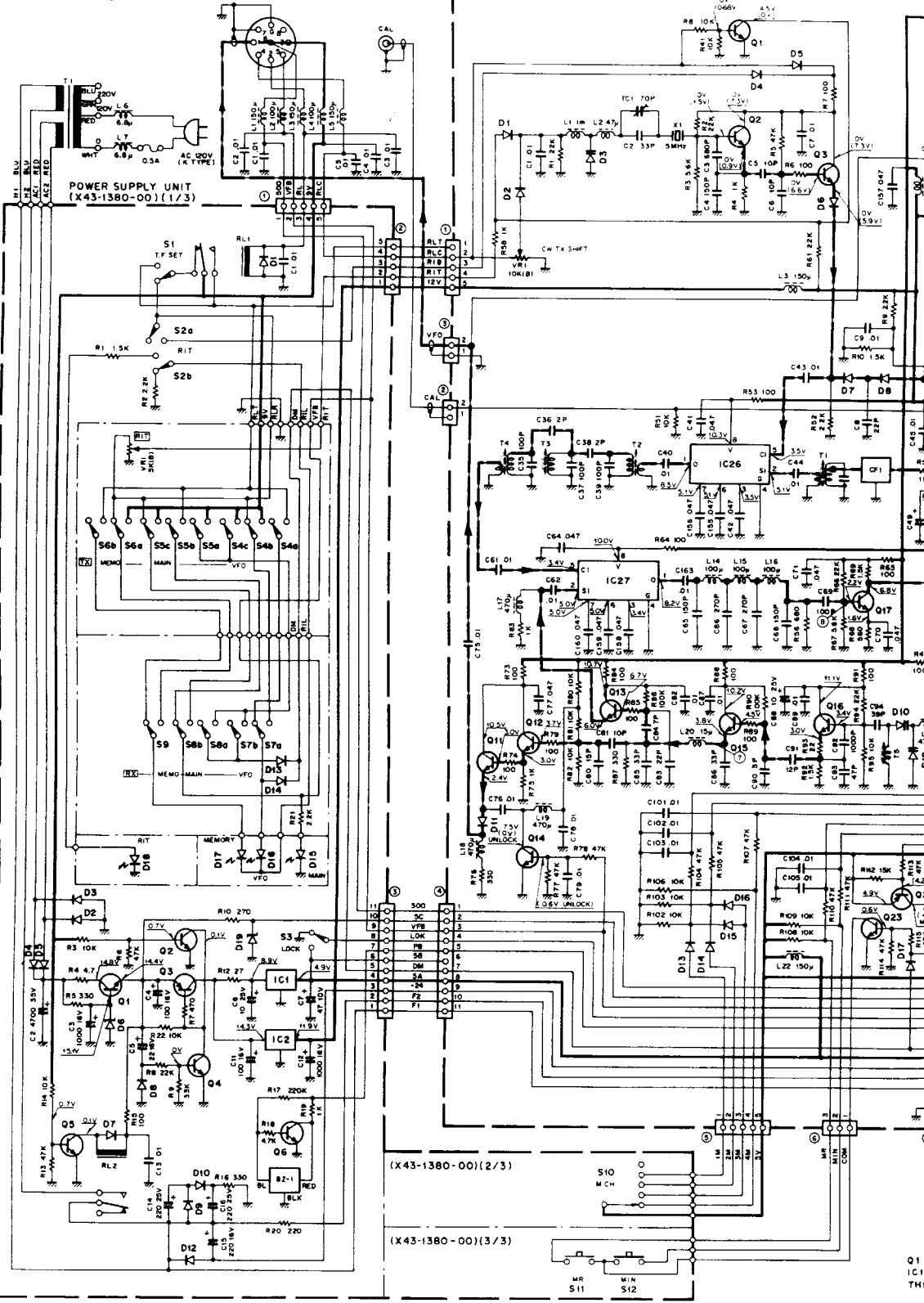
μPC1037H

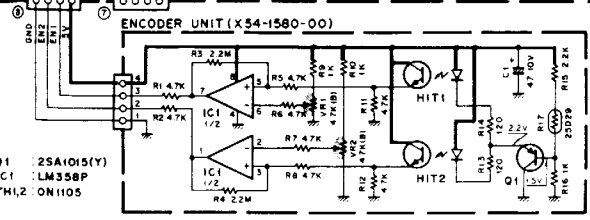
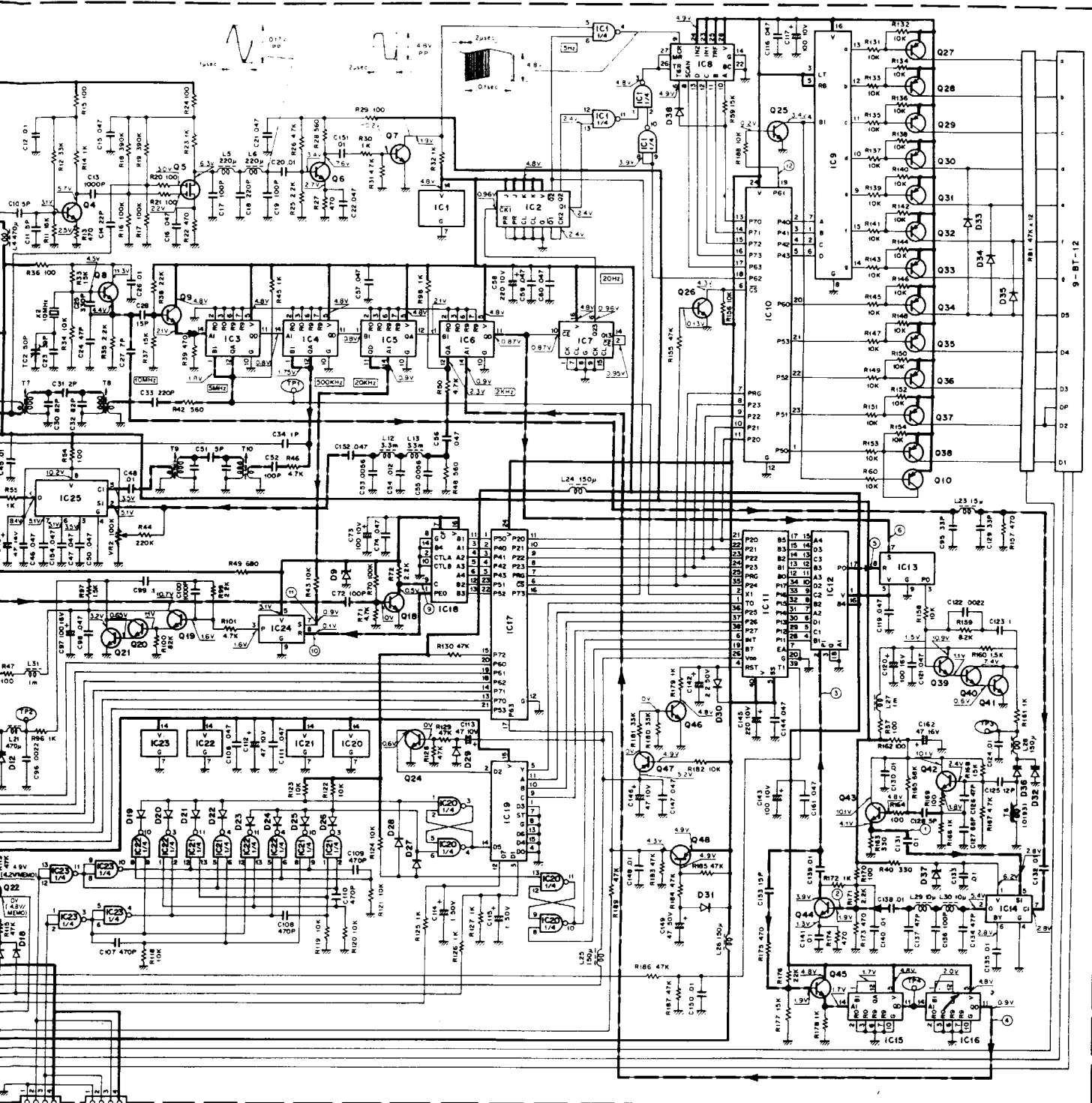


μPC14305H



DIGITAL UNIT (X54-1570-00)

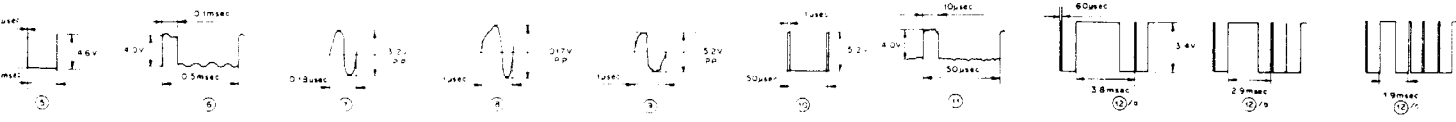




- |   |           |              |                                |
|---|-----------|--------------|--------------------------------|
| Q 1~4, 6~9, 12, 13, 15~18, 23~26, 42~46 | IC 7      | TC4518BP     | D 1, 2, 4, 5, 13~31, 33~35, 38 |
| Q 5                                     | IC 8      | TC5032P      | IS1555                         |
| Q 11, 14                                | IC 9      | SN74LS247N   | D 3, 10, 12, 32, 36            |
| Q 19~21, 39~41                          | IC 10, 17 | JPD8243C     | ISV548C                        |
| Q 10, 22, 27~38, 47, 48                 | IC 11     | JPD8048C-155 | D 6~8, 11                      |
|   | IC 12     | TC9122P      | IS1587                         |
|   | IC 13, 24 | TC5081P      | D 9                            |
|   | IC 14     | JPC1037H     | WZ-050                         |
| IC 1, 20~23                             | IC 18     | MC14569B     | D 37                           |
| IC 2                                    | IC 19     | HD74LS151P   |                                |
| IC 3~6, 15, 16                          | IC 25~27  | SN16913P     |                                |

Display

: 0.0~9.9 : 100.0~599.9 : 10.0~99.9



< Note > Wave forms are displayed at 0.0 (VFO output 5.5 MHz)