

# ERRATA FOR THE FT-980 OPERATING MANUAL

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The following corrections and additions apply to the first printing of the FT-980 Operating Manual:

## Page 20

Later printings of the Operating Manual include important notes related to the interconnection of linear amplifiers. Page 3 of this Technical Supplement is a replacement for page 20 of the first printing of the Operating Manual.

## Page 21

The note beneath the drawing of the ACC-2 plug wiring should be replaced with the following:

“(Do not jumper from pin 4 to GND)”

## Page 22

In diagram 2, showing the signal flow through the IF filters with only the optional CW-W filter (XF-8.9HC) installed in position XF<sub>2006</sub>, the label on the arrow pointing into the CW-W filter should say “CW-N”, and not “CW-W”. The CW-W signal passes through SSB filter position XF<sub>2005</sub>.

## Page 33

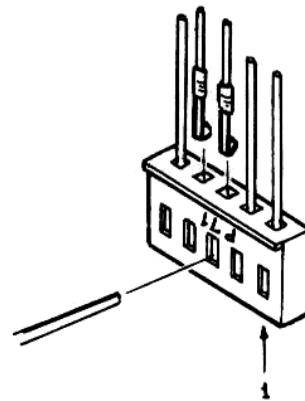
The following paragraph is added to step 3:

If the XF-455.8MCN CW-N filter is not being installed, and is not installed already, locate plug P<sub>71</sub> (on J<sub>2001</sub>), and reverse the wires in locations 3 and 4, so that the white/orange wire ends up at pin 3, and white/red at pin 4.

Also, the next paragraph is added to step 5:

Check the colors of the wires at pins 3 and 4 of P<sub>71</sub> (on J<sub>2001</sub>). Make sure that the white/red wire is at pin 3, and the white/orange wire is at pin 4. If not, reverse the connectors at these pins.

and the drawing at the right is added to the page, showing the method of removing the wire connectors from P<sub>71</sub>.



# LINEAR AMPLIFIER INTERCONNECTIONS

When a linear amplifier is used with the FT-980, check the current required to control the T/R relay in the linear amplifier. If less than 200 mA, the T/R control line can be directly connected to TX GND and GND on ACC-2 jack. However, also be sure that a back pulse cancelling diode is installed across the T/R relay in your linear amplifier. If this diode is not present, install a general purpose rectifier diode as shown in Figure 1.

When the required T/R relay current is higher than 200 mA, the T/R control line from the linear amplifier must not be connected directly to the ACC-2 jack, but an extra relay box must be used to avoid damage to the T/R relay in the FT-980. Refer to Figure 2, and make the relay box for the interconnection. This relay box is not available from Yaesu.

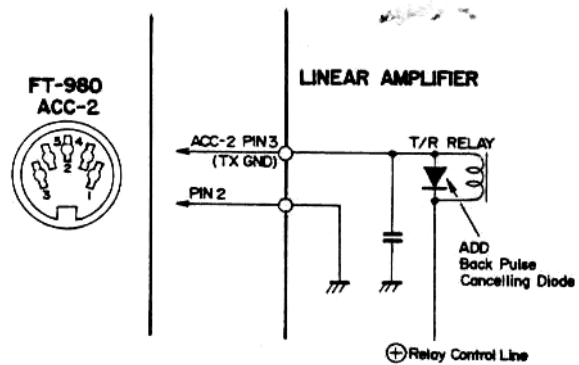


Figure 1

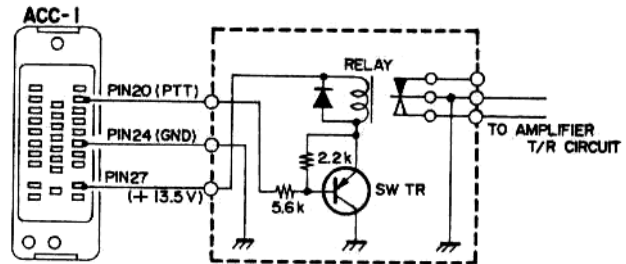
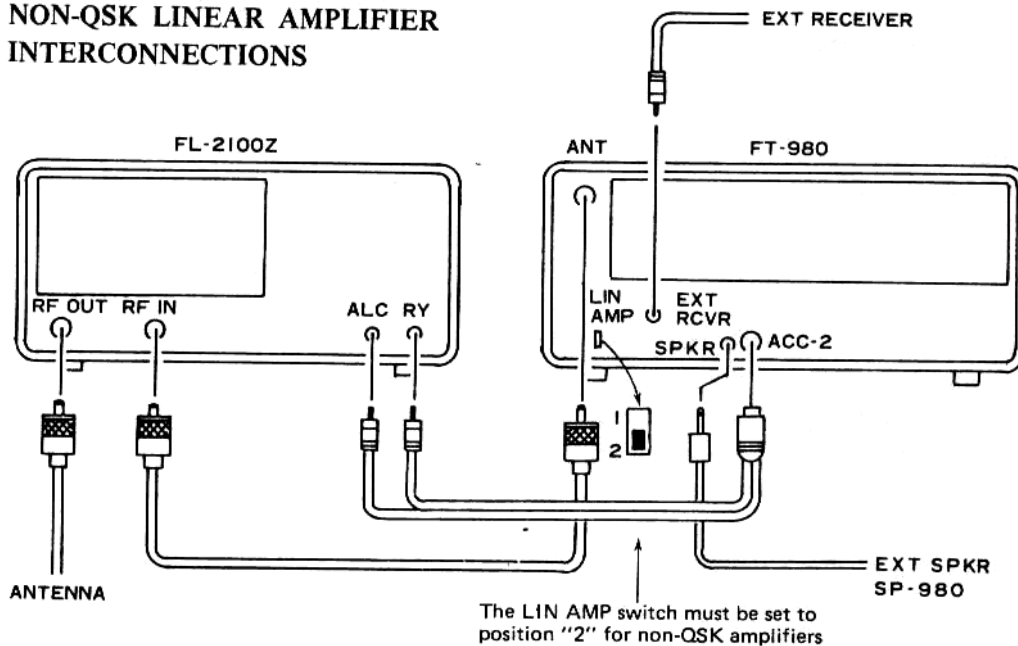
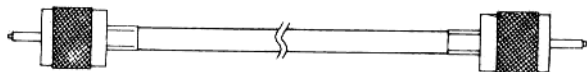


Figure 2

## NON-QSK LINEAR AMPLIFIER INTERCONNECTIONS



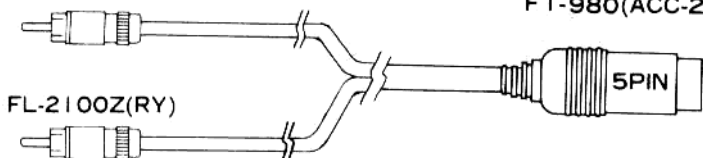
FL-2100Z  
FC-102  
FC-902



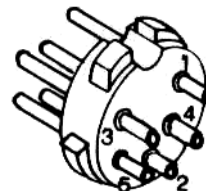
FT-980 (ANT)

FL-2100Z (ALC)

FT-980 (ACC-2)



OPTIONAL CABLE



- 1 EXT ALC
- 2 GND
- 3 TX GND
- 4 DELAY
- 5 RX GND

If the closing time of the T/R relay in the linear amplifier is long enough to cause the ALC of the FT-980 to pulse at the start of transmission, install a jumper between pins 4 and 2 of this plug. If in doubt, install the jumper.

Please read the caution notice on page 32.

ACC-2 Plug Connections

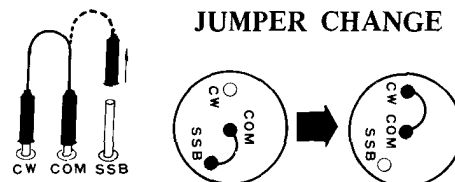
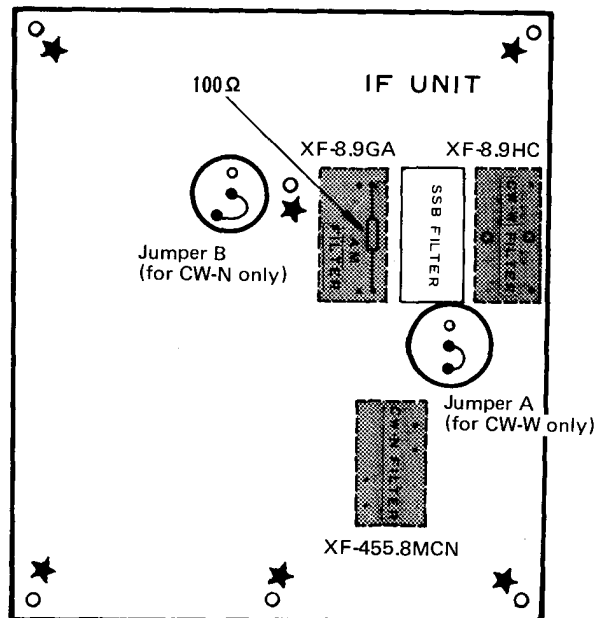
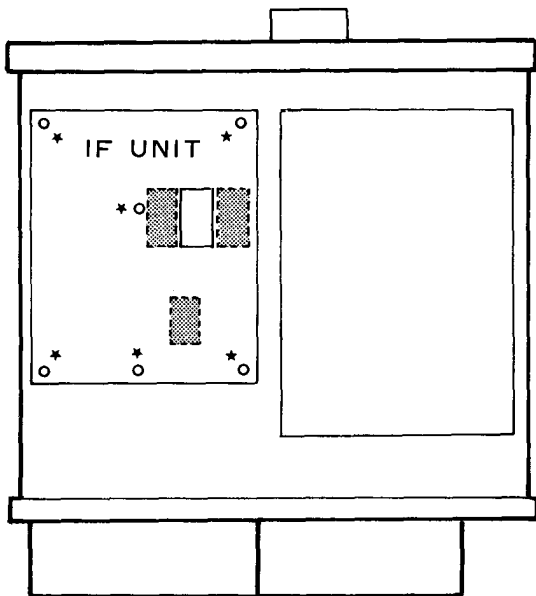
# OPTIONAL CRYSTAL FILTER INSTALLATION

## OPTIONAL FILTER INSTALLATION

This procedure is for installation of CW-W filter XF-8.9HC (Kit no. D2000011), AM filter XF-8.9GA (Kit no. D2000012), and CW-N filter XF-455.8MCN (Kit no. D2000035); or any one or combination of these.

1. Disconnect the transceiver from the power source, and place it upside down on the work surface. Then remove the ten screws affixing the bottom cover, and the two screws affixing the carrying handle. Remove the cover and handle.
2. Locate the IF Unit, shown in the figure below, and remove the six screws marked with a star.
3. If installing the **XF-8.9HC CW-W filter**, refer to the figure below for the correct location on the board, and bolt the filter into place using the hardware supplied with the kit. Then solder the filter terminals into place on the solder side of the board. For this filter only, locate Jumper A as shown below, and change the connection of this jumper from the SSB to the CW position.

4. If installing the **XF-8.9GA AM filter**, refer to figure below for the correct location on the board. Notice that there is a 100-ohm resistor in this filter location, which must be carefully unsoldered and removed before the filter is installed. Once this resistor has been removed, hold the filter snugly in place on the board while soldering the terminals on the solder side of the board.
5. For installation of the **XF-455.8MCN CW-N filter**, refer to the figure below for the correct location on the board. Hold the filter snugly in place on the board while soldering the terminals on the solder side of the board. Now refer to the figure below for the location of Jumper B, and change the connection of this jumper from the SSB to the CW position (but **only** when installing this filter).
6. Replace the IF Unit and its six screws, making sure that no wires are stressed or pinched in the process. Then replace the bottom cover and its ten screws, followed by the carrying handle and its two screws.



# INSTALLATION

The FT-980 is designed for operation from AC power only. Power supply connections providing for operation from a variety of source voltages are available.

## PRELIMINARY INSPECTION

Upon opening the packing carton, immediately give the transceiver a thorough visual inspection. Check to see that all controls and switches are working freely, and inspect the cabinet for any signs of damage. If any damage has been sustained, immediately contact the shipping company, and document the damage completely. Save the packing carton and foam packing material for possible use at a later date.

## POWER CONNECTION

The FT-980 is designed for use in many areas of the world, using a variety of different supply voltages. Be absolutely certain that the voltage specification marked on the rear of the transceiver agrees with the local AC supply voltage. **THIS INSPECTION MUST BE MADE BEFORE CONNECTING THE AC POWER CORD TO THE REAR APRON OF THE TRANSCEIVER.** If the transceiver is wired for another supply voltage, change the connections to the primary of the power transformer as shown below. Also change the label on the rear panel.

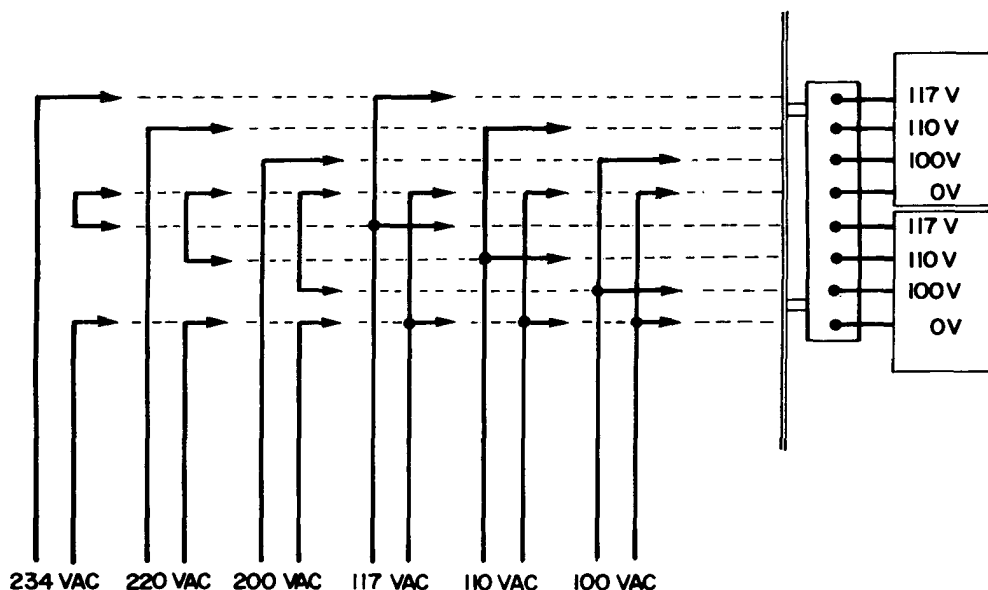
### CAUTION

PERMANENT DAMAGE WILL RESULT IF IMPROPER AC SUPPLY VOLTAGE IS APPLIED TO THE TRANSCEIVER. OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY APPLICATION OF IMPROPER SUPPLY VOLTAGE. DO NOT CONNECT THE AC POWER CORD TO A DC POWER SOURCE.

## TRANSCEIVER LOCATION AND GROUND

In all station installations, a primary consideration is adequate air circulation around the heat sink and through the case. Do not place books or papers on or around the cabinet, and do not place the FT-980 on top of another heat-generating device, such as a linear amplifier. Avoid heat ducts and window locations that might expose the transceiver to excessive direct sunlight, especially in warm climates.

Ground the transceiver using a heavy braided cable of the shortest length possible. Water pipes are generally not satisfactory as grounding points; it is better to use earth rods with the grounding cable securely connected to each point in the ground system.



POWER TRANSFORMER PRIMARY CONNECTIONS



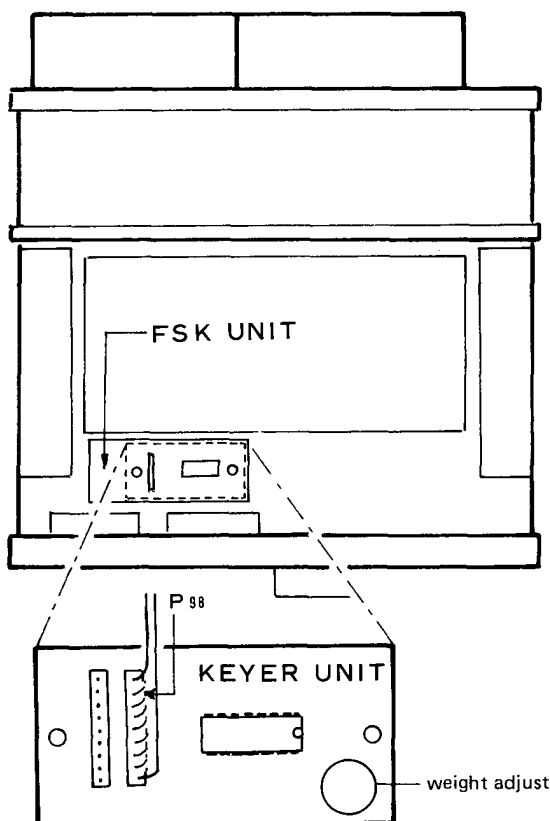
# KEYER UNIT INSTALLATION

## KEYER UNIT INSTALLATION

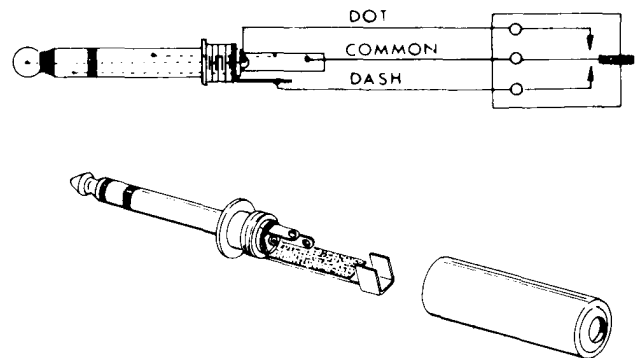
Requires optional Keyer Kit no. D3000026, consisting of:

One Keyer Unit, part no. C017280  
Two mounting screws

1. Remove the eight screws affixing the top cover, and the two carrying handle screws. Remove the cover slowly, so as not to stress the speaker wires.
2. Referring to the figure below, locate the FSK Unit and 8-pin connector P<sub>98</sub> taped behind the meters. Using the two supplied mounting screws, affix the Keyer Unit to the FSK Unit as illustrated. Then connect P<sub>98</sub> to the connector on the Keyer Unit.

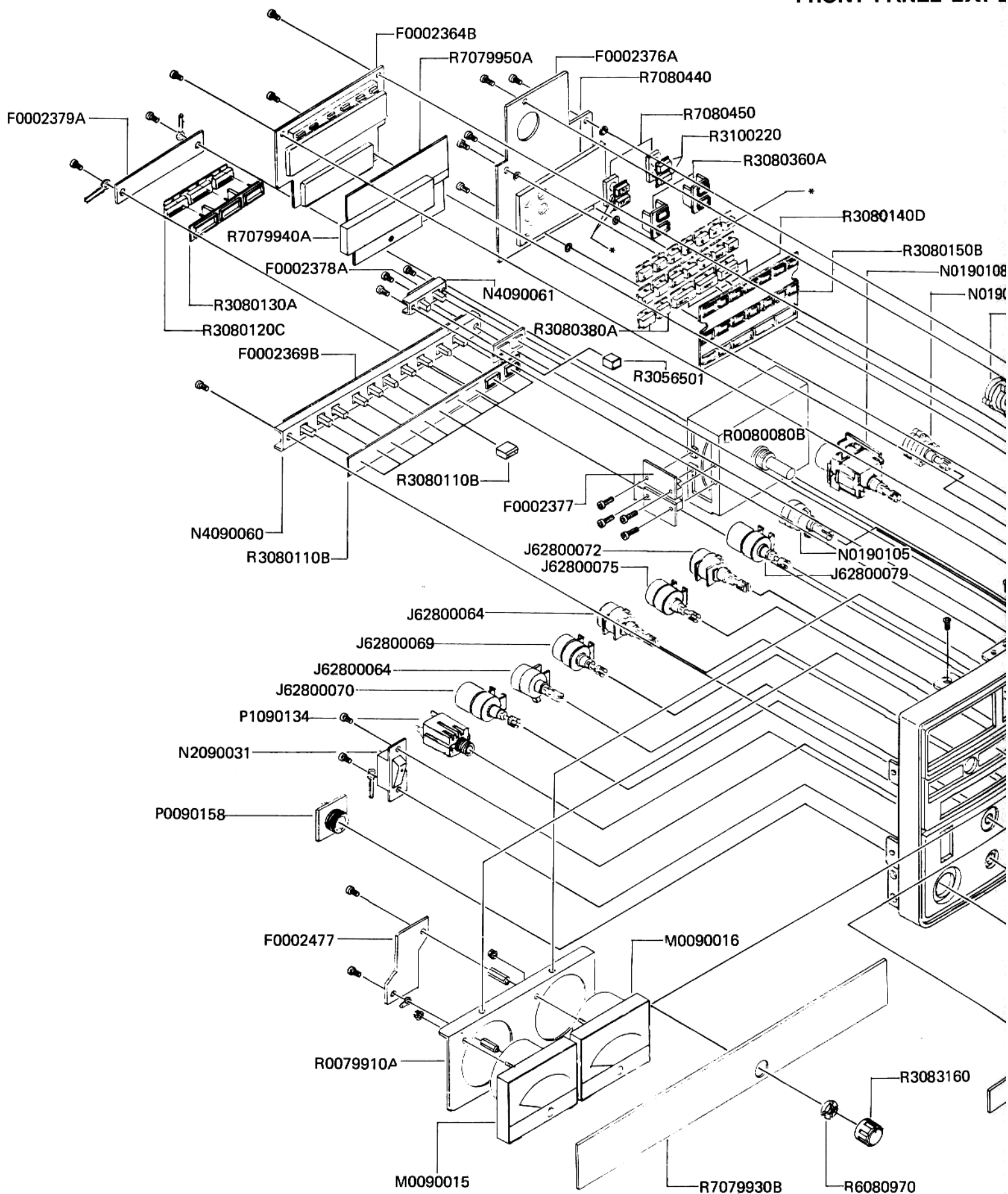


3. Connect keyer paddles to the AUTO jack on the rear panel, as indicated in the figure. Set the FT-980 controls for CW transmission, but with the DRIVE control fully counterclockwise. Squeeze the paddles and adjust the KEYER control on the front panel for the desired speed, and then adjust the potentiometer on the KEYER Unit for the desired keying weight.
4. Replace the top cover and its eight screws, and the carrying handle and its two screws. Installation is now complete.



Keyer paddle plug connections

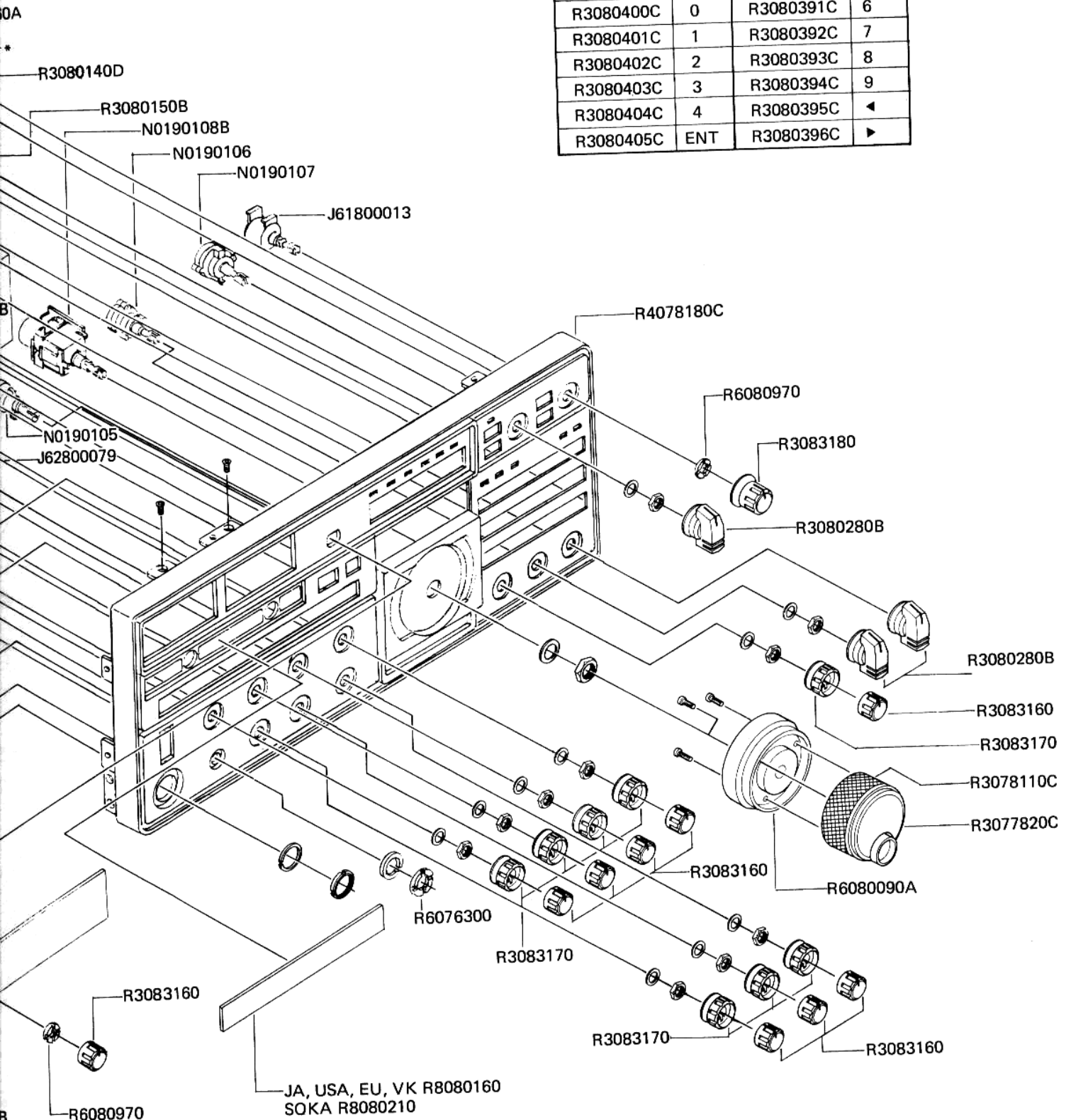
# FRONT PANEL EXPL



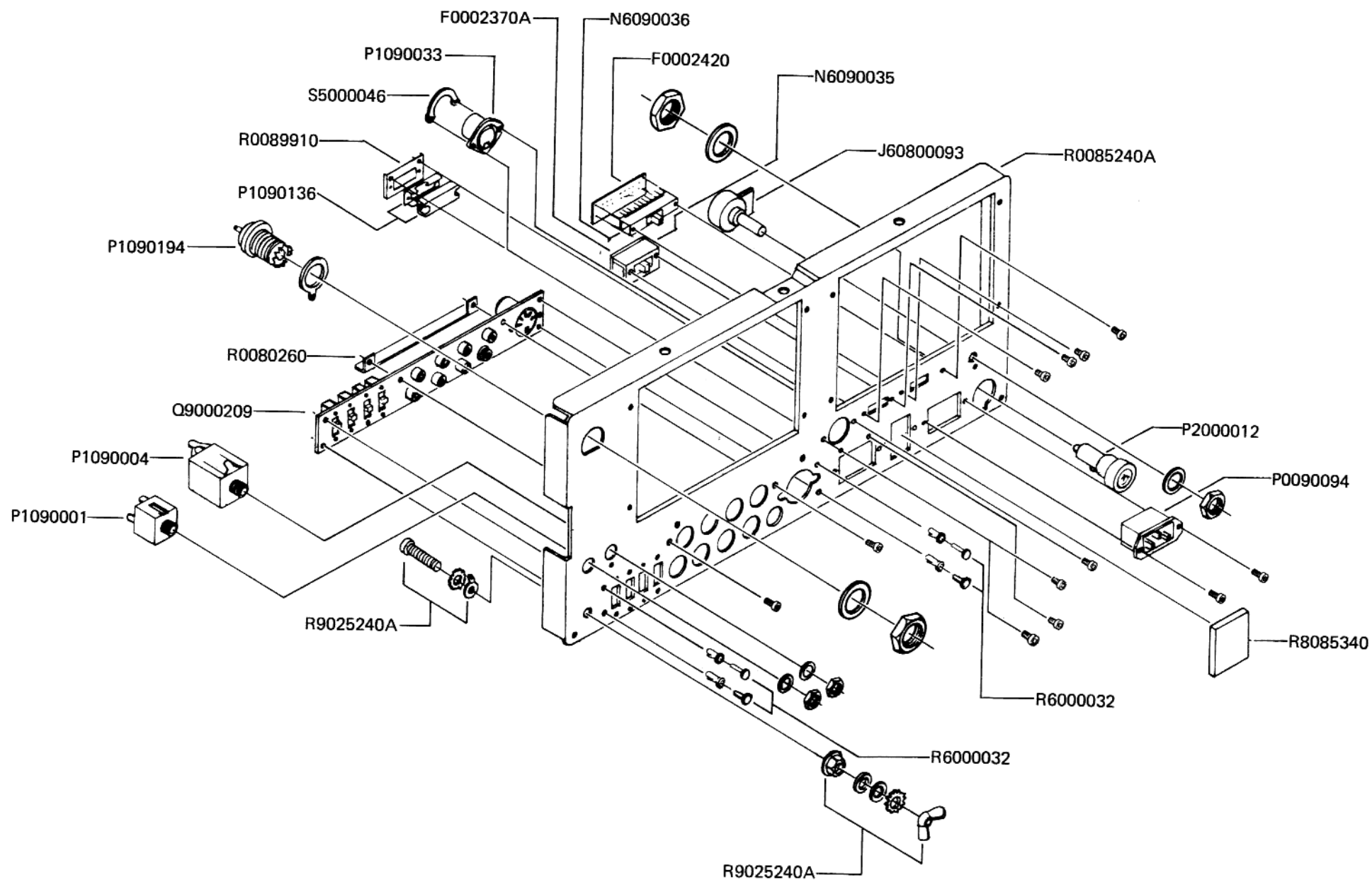
# FRONT PANEL EXPLODED VIEW

\* KEY-TOP

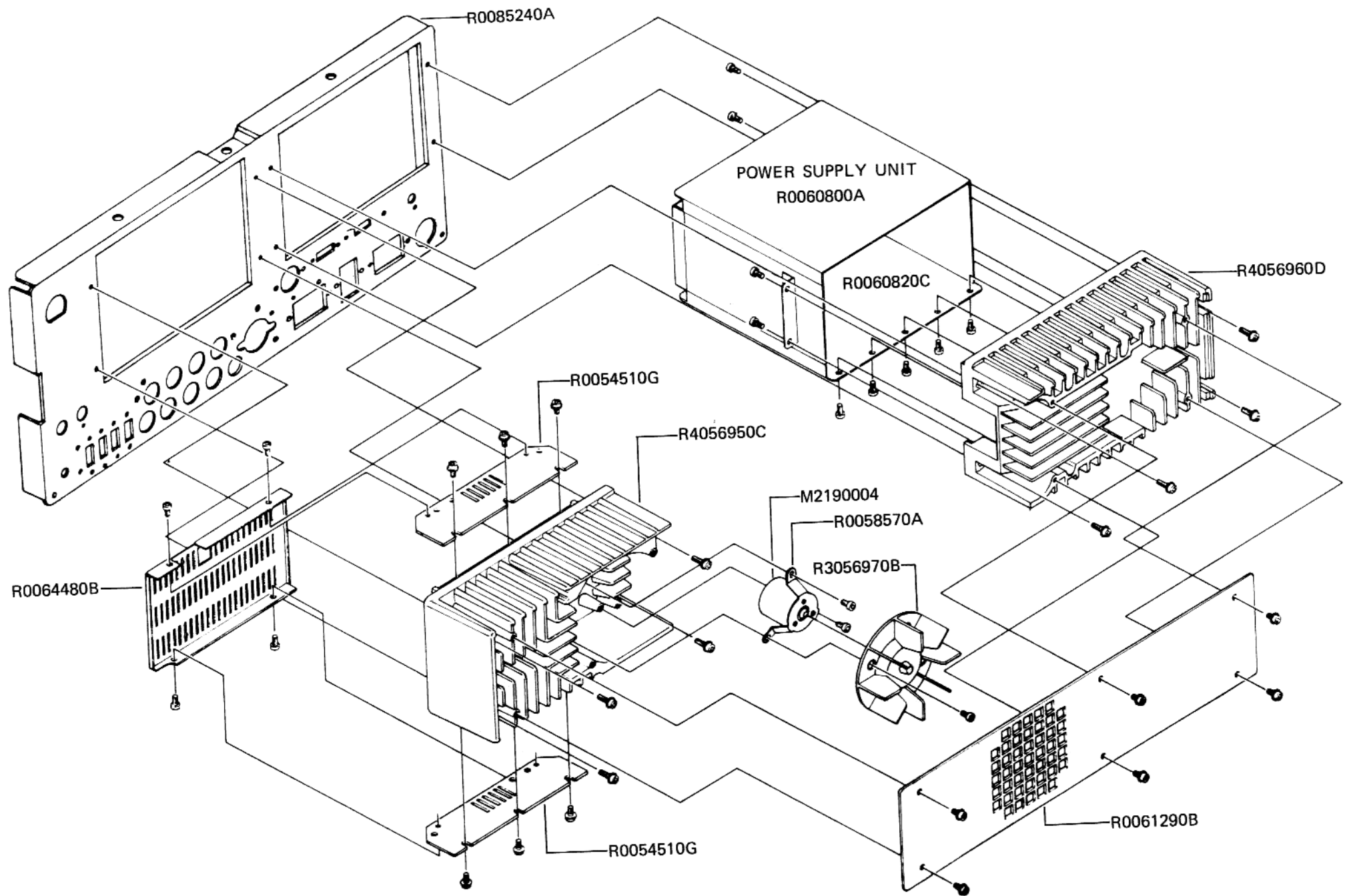
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R3080371A	LDB	R3080390C	5
R3080400C	0	R3080391C	6
R3080401C	1	R3080392C	7
R3080402C	2	R3080393C	8
R3080403C	3	R3080394C	9
R3080404C	4	R3080395C	◀
R3080405C	ENT	R3080396C	▶

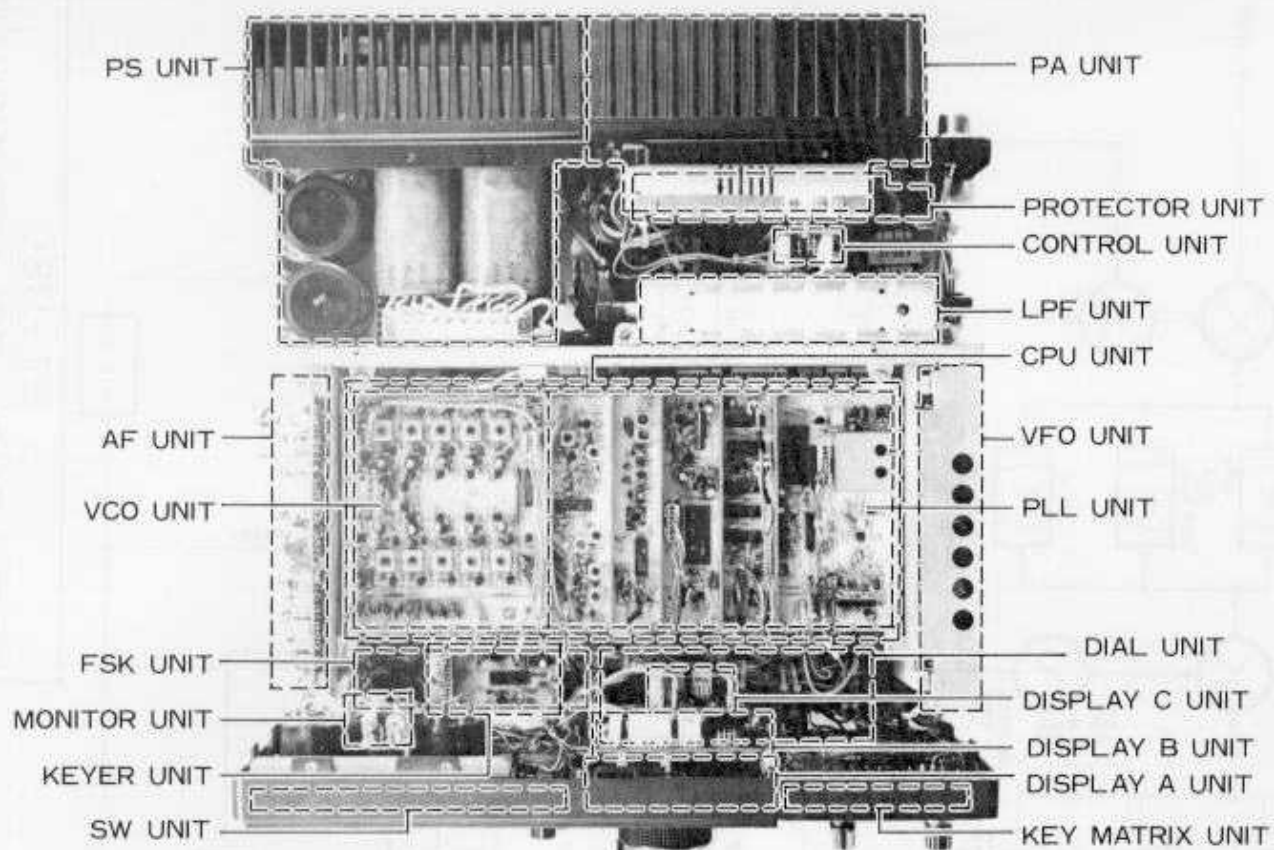


# REAR PANEL EXPLODED VIEW 1

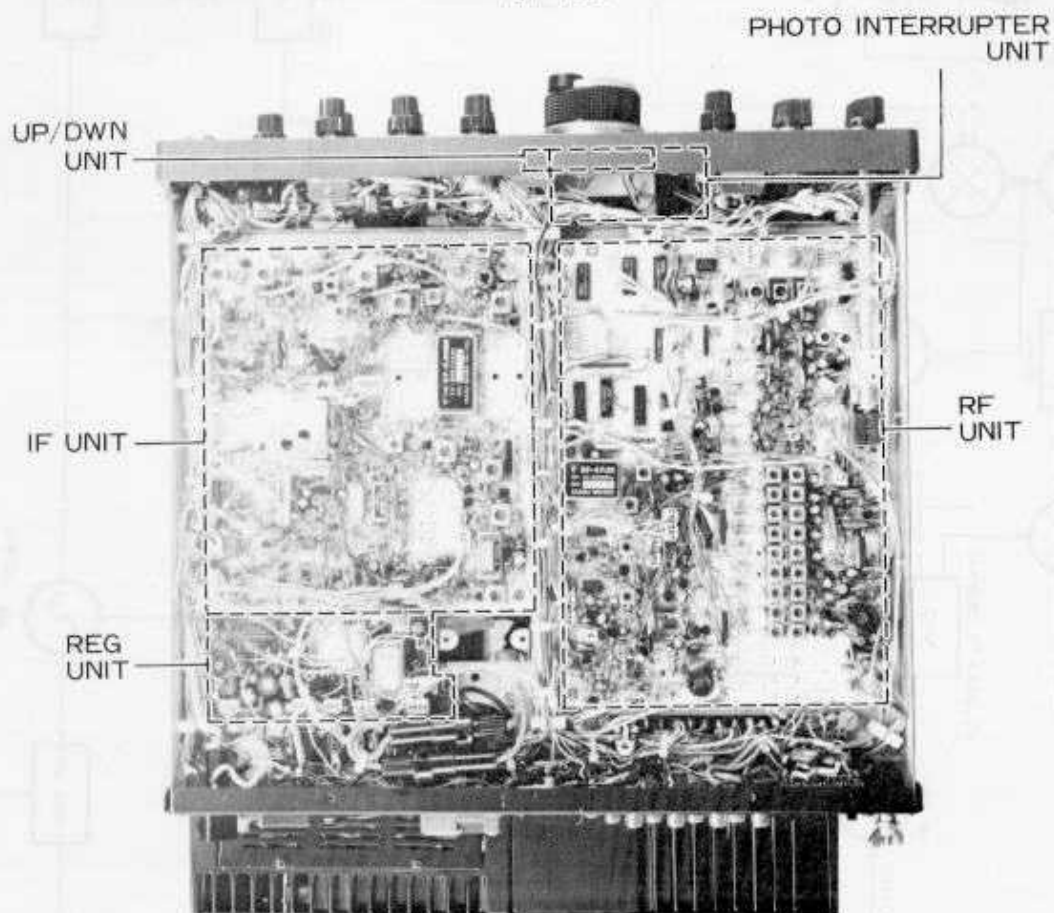


# REAR PANEL EXPLODED VIEW 2





TOP VIEW



BOTTOM VIEW



# ERRATA FOR THE FT-980 TECHNICAL SUPPLEMENT

The following corrections apply to the first printing of the FT-980 technical supplement

## RF Unit (page 8)

Add type 1SS53 (general purpose silicon) diode  $D_{1096}$  between the common anodes of the diodes connected to  $J_{1016}$  and pin 10 of  $Q_{1028}$ . The cathode of the new diode connects to  $Q_{1028}$ . Install on the solder side of the board, and use plastic insulating sleeves on each lead of the diode.

## VFO Unit (page 9)

Remove resistors  $R_{7067}$  and  $R_{7093}$ .

## PLL/VCO Unit (pages 10–12)

On the solder side of the board, cut the indicated track on the copper pattern in the area between  $Q_{4011}$  and  $Q_{4013}$ , and install the two jumpers as indicated in the figures on page 10.

Referring to page 11, remove resistors  $R_{4036}$ ,  $R_{4037}$  and  $R_{4038}$ , capacitor  $C_{4042}$ , and diode  $D_{4002}$  and inductor  $L_{4008}$ . Replace  $R_{4036}$  with 1.5 kilohms in the same location as the original part. Replace  $R_{4037}$  with 100 kilohms, but install one lead in the hole originally used for the nearest lead of  $C_{4042}$  (removed), as illustrated. Replace  $L_{4008}$  with 390  $\mu$ H in the same location.

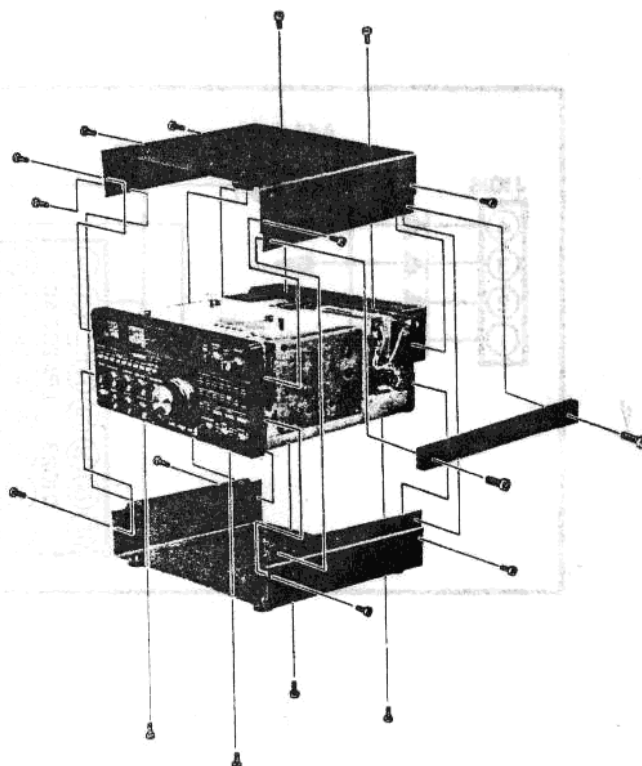
In the VCO enclosure on the PLL/VCO Unit (page 12), remove capacitors  $C_{4009}$  and  $C_{4011}$ , and replace both with the same value CH-type (instead of RH and UJ, removed). Make sure that these have not already been changed before removing: the CH types have black paint on the top, or are marked "CH". Also in the same area, replace  $C_{4006}$  with 4 pF CH,  $C_{4007}$  with 16 pF CH, and  $C_{4008}$  with 8 pF CH.

Add a silicon diode, a germanium diode and a 10  $\mu$ F, 16 WV tantalum capacitor on the solder side as indicated in the Figures on page 10.

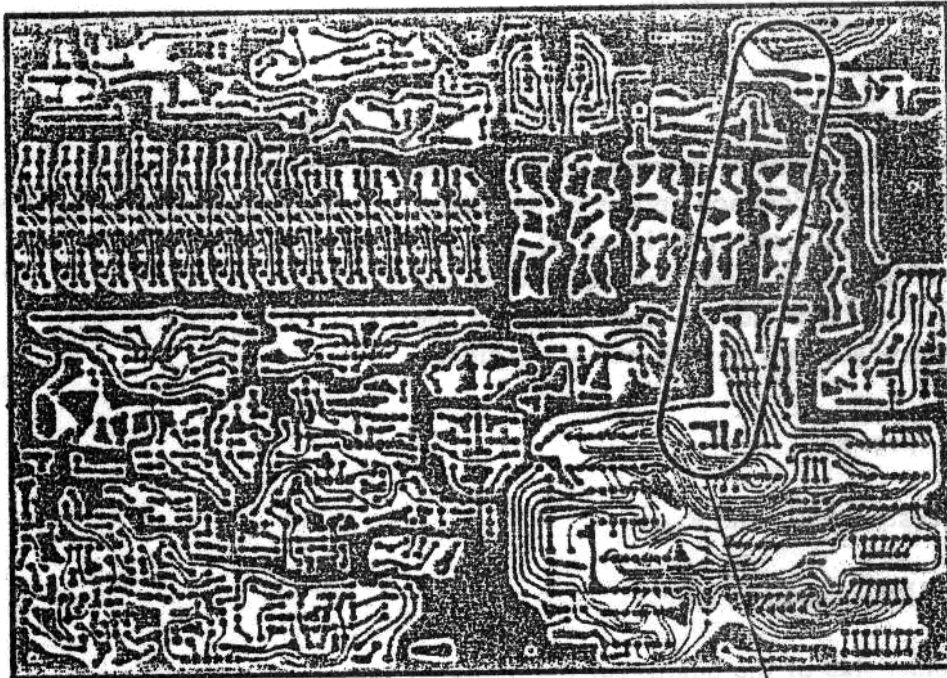
## FSK Unit

Remove capacitor  $C_{1802}$ , shown on page 12.

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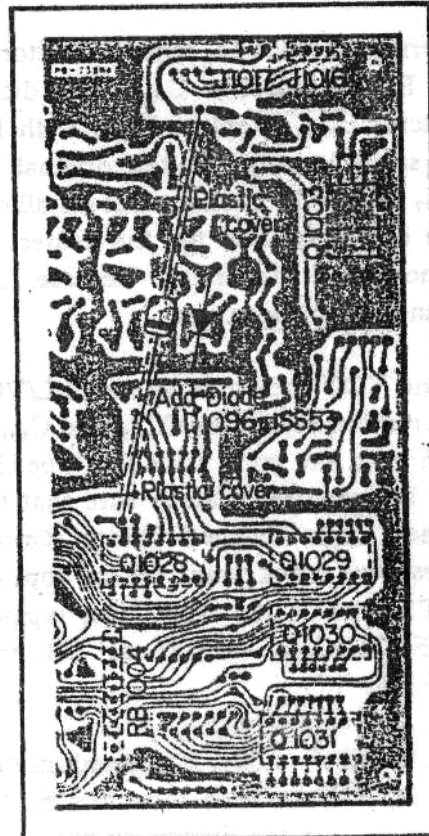
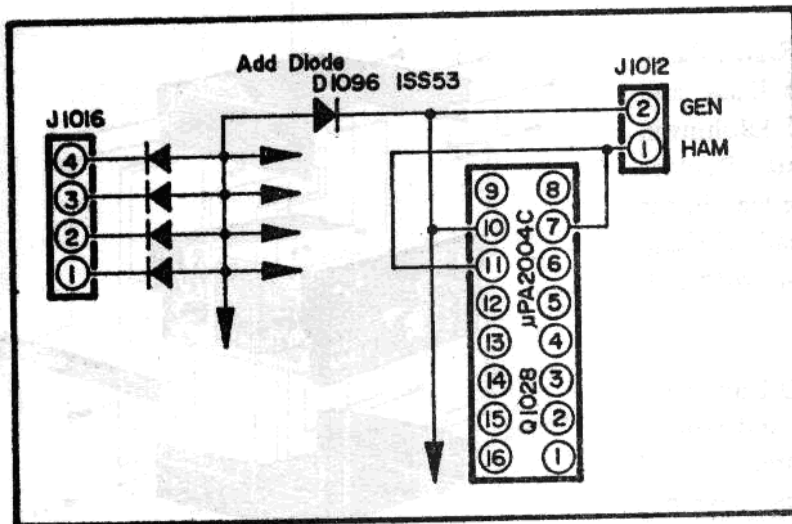


# RF UNIT



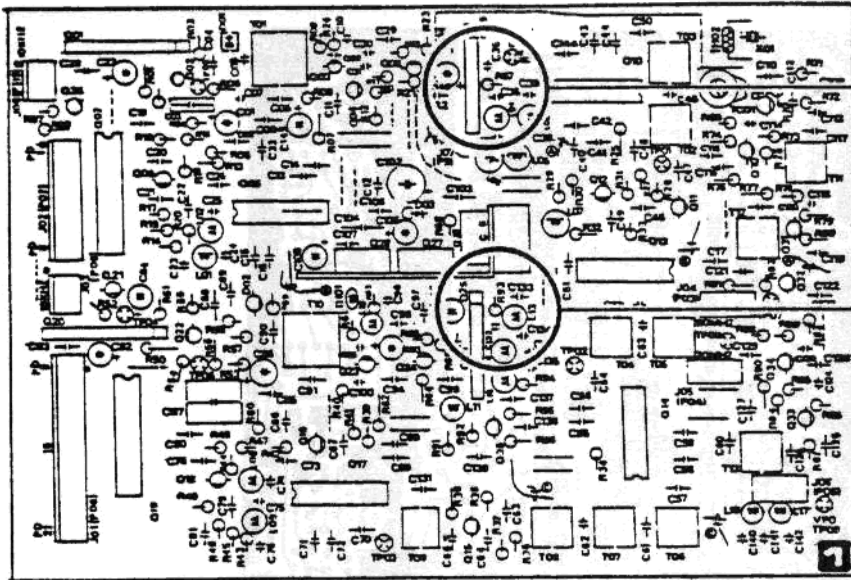
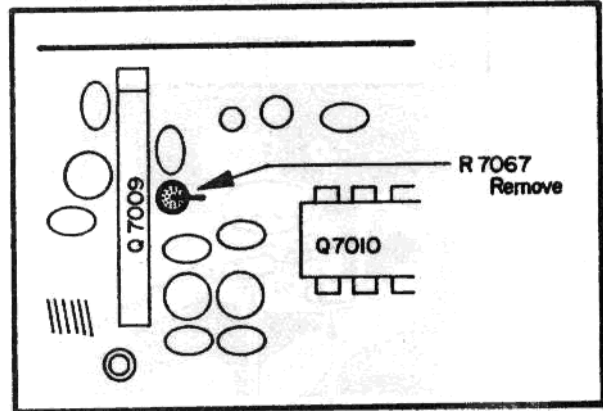
RF UNIT

Solder side



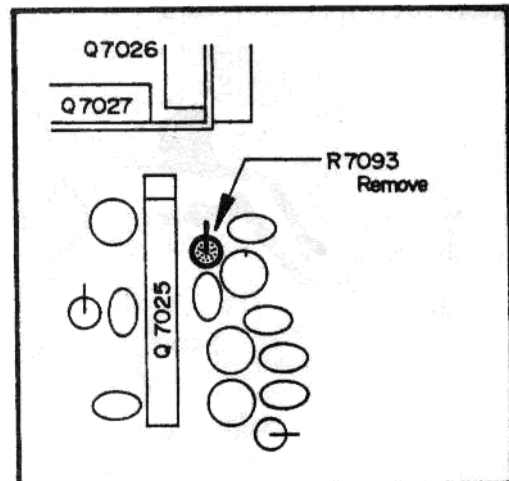


# VFO UNIT

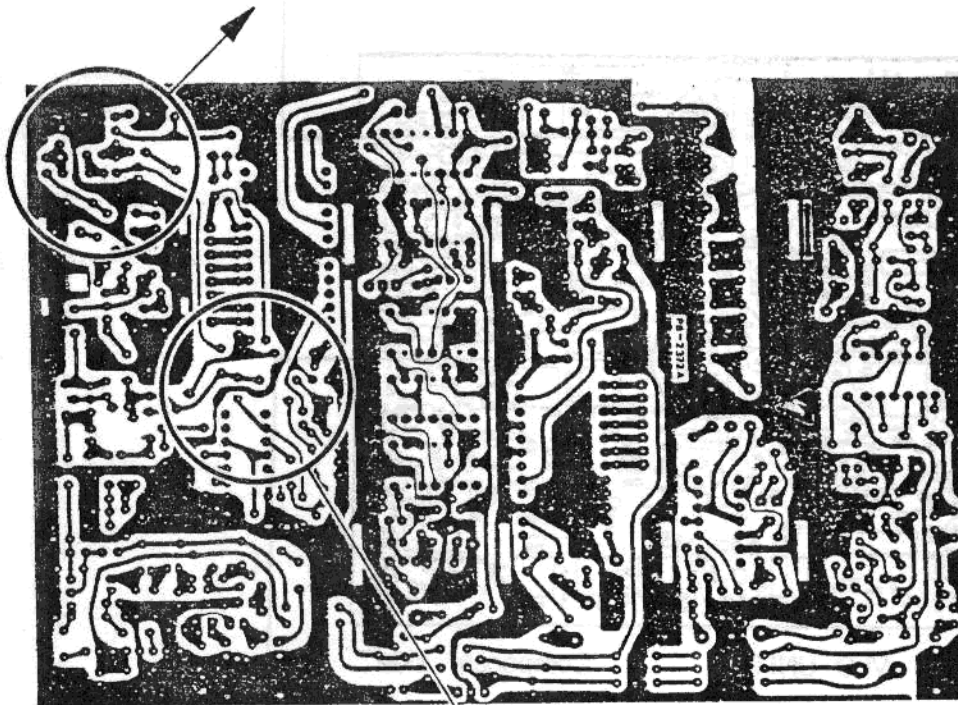
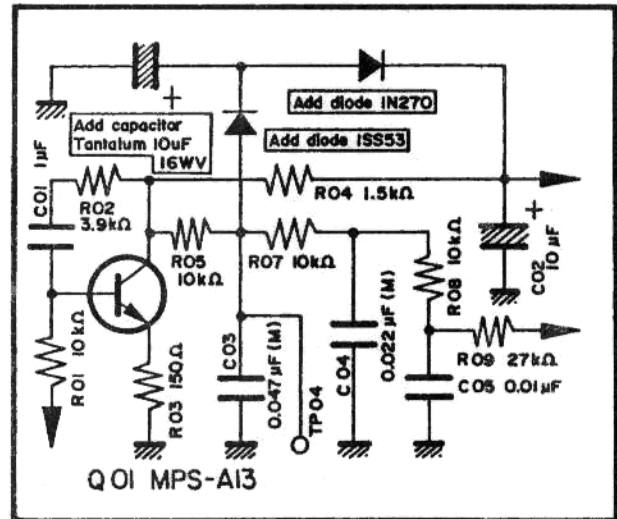
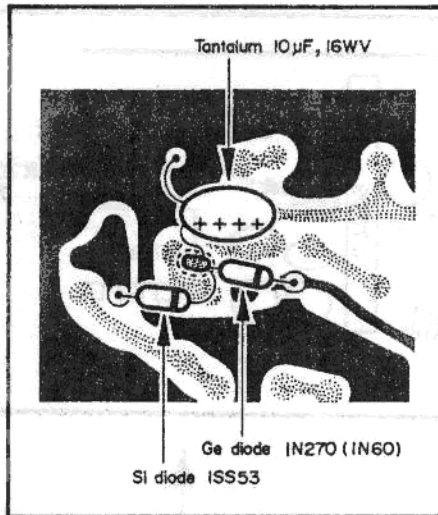


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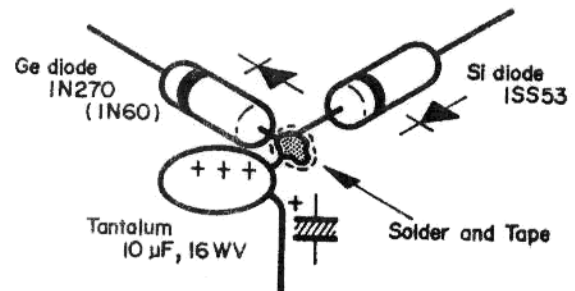
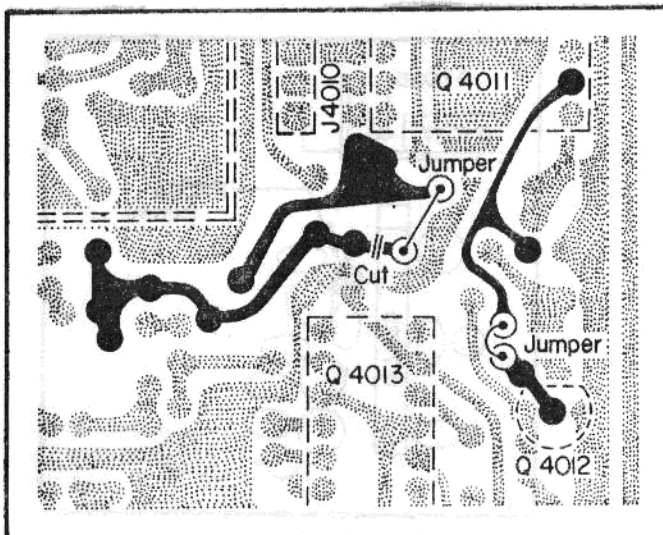
Component side



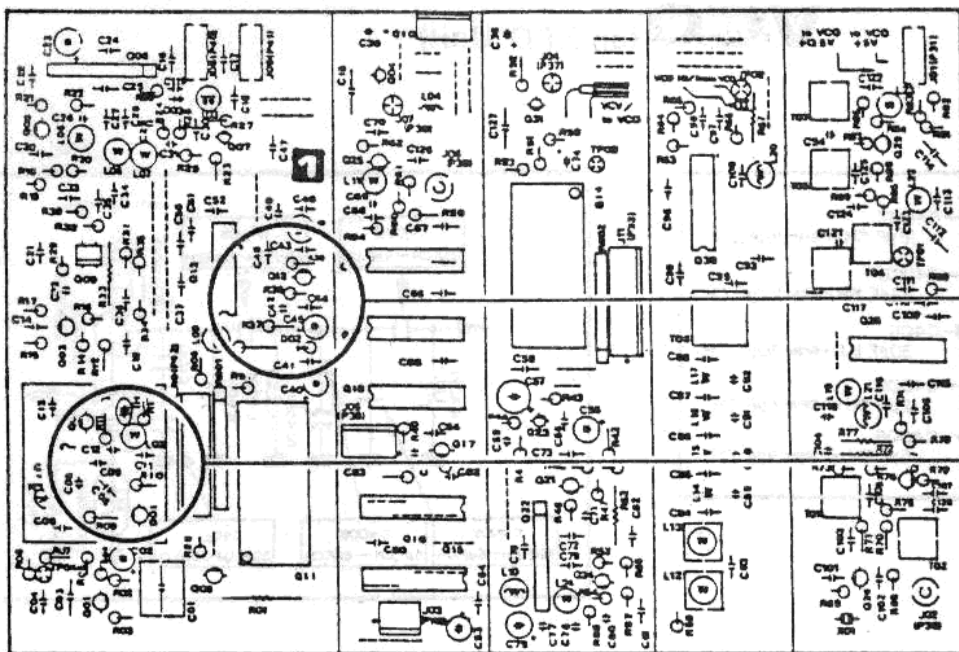
# PLL/VCO UNIT



PLL/VCO UNIT Solder side



# PLL/VCO UNIT

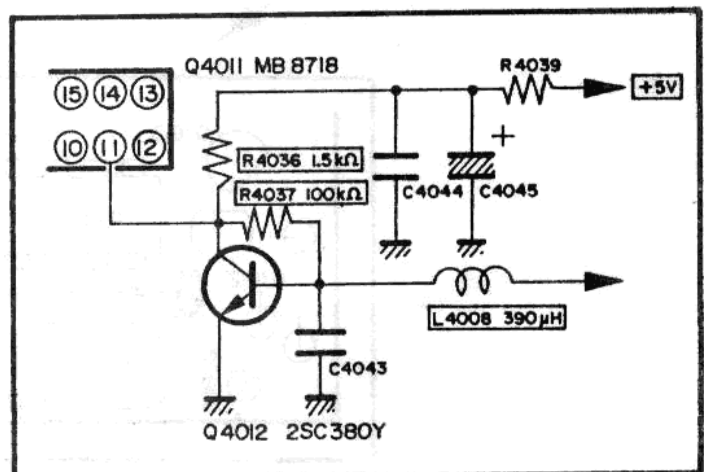
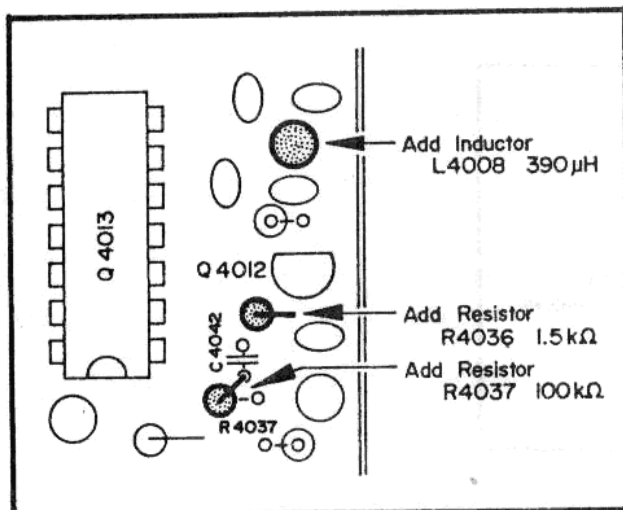
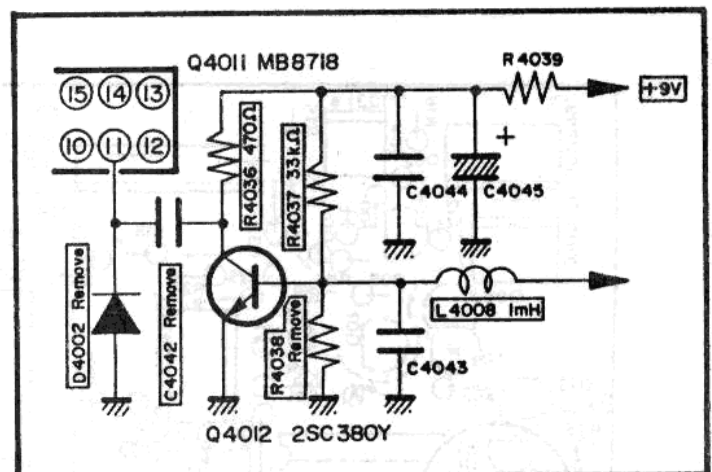
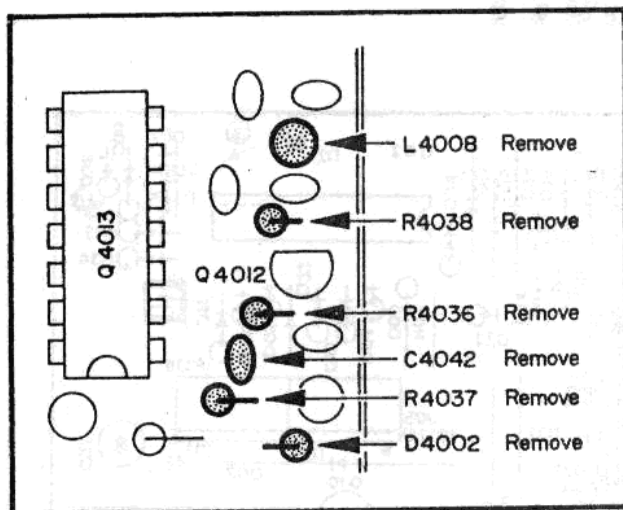


See below

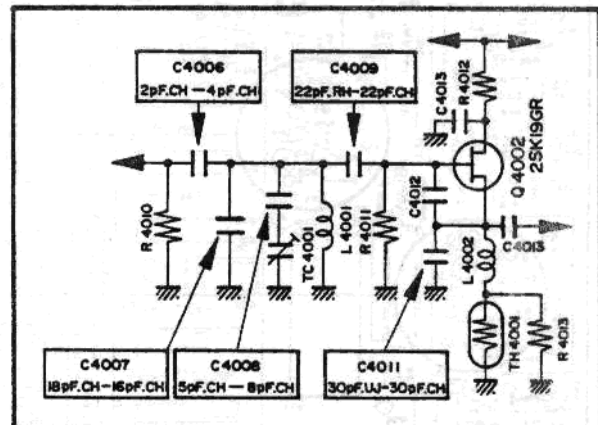
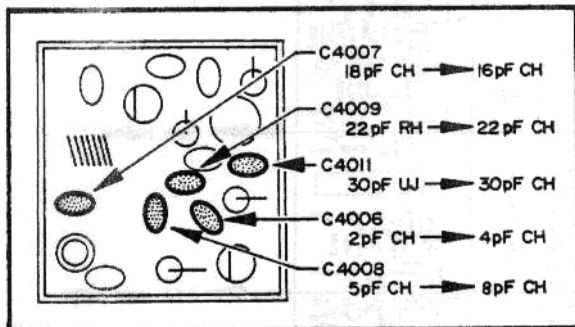
See next page

PLL/VCO UNIT

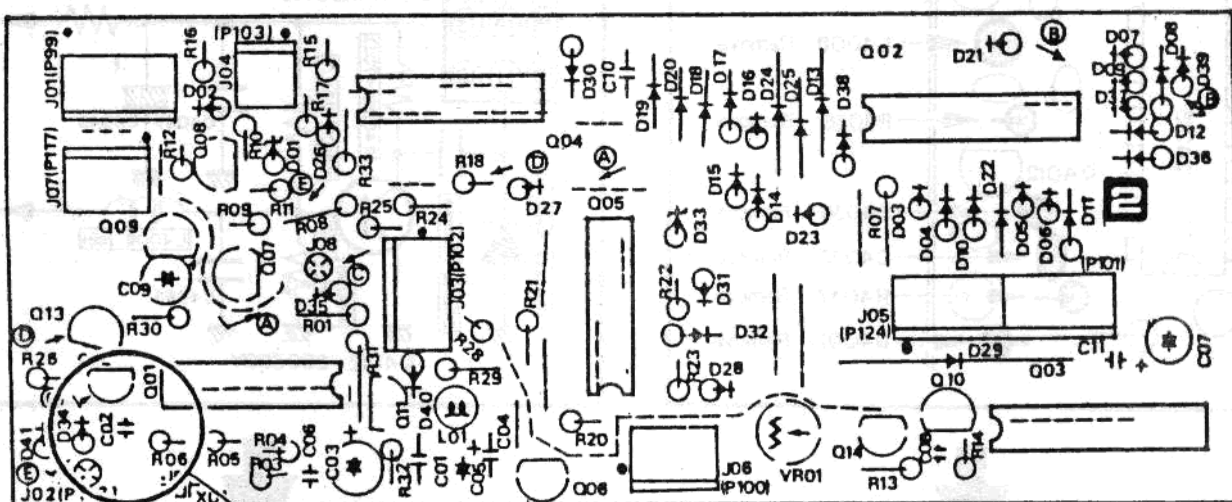
Component side



## VCO (on VFO Unit)

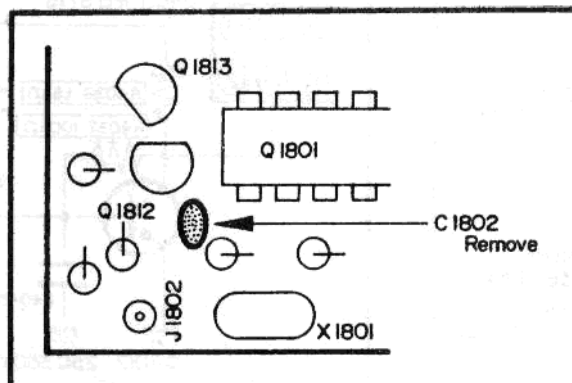


## FSK UNIT



FSK UNIT

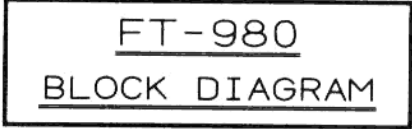
Component side

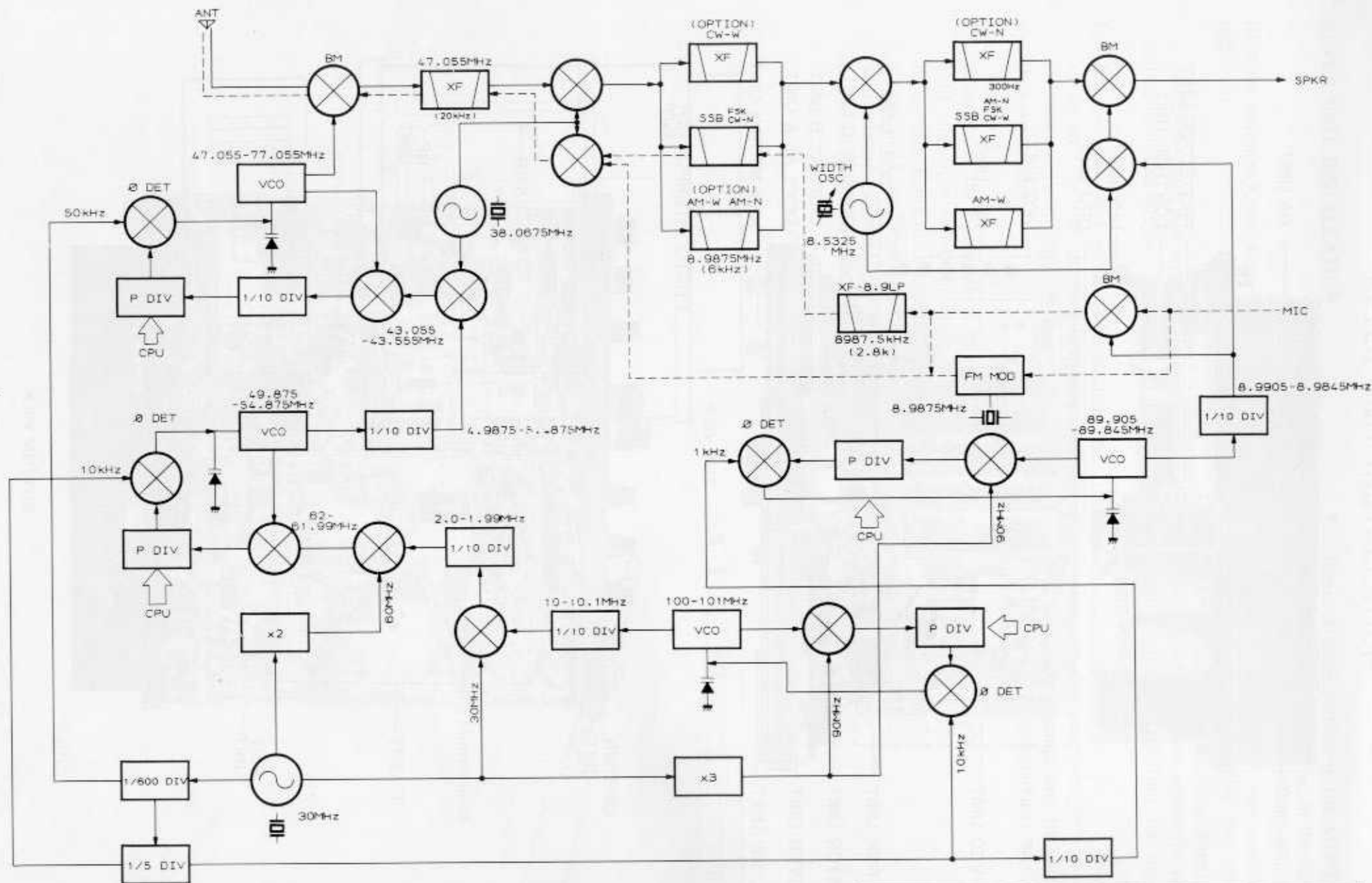


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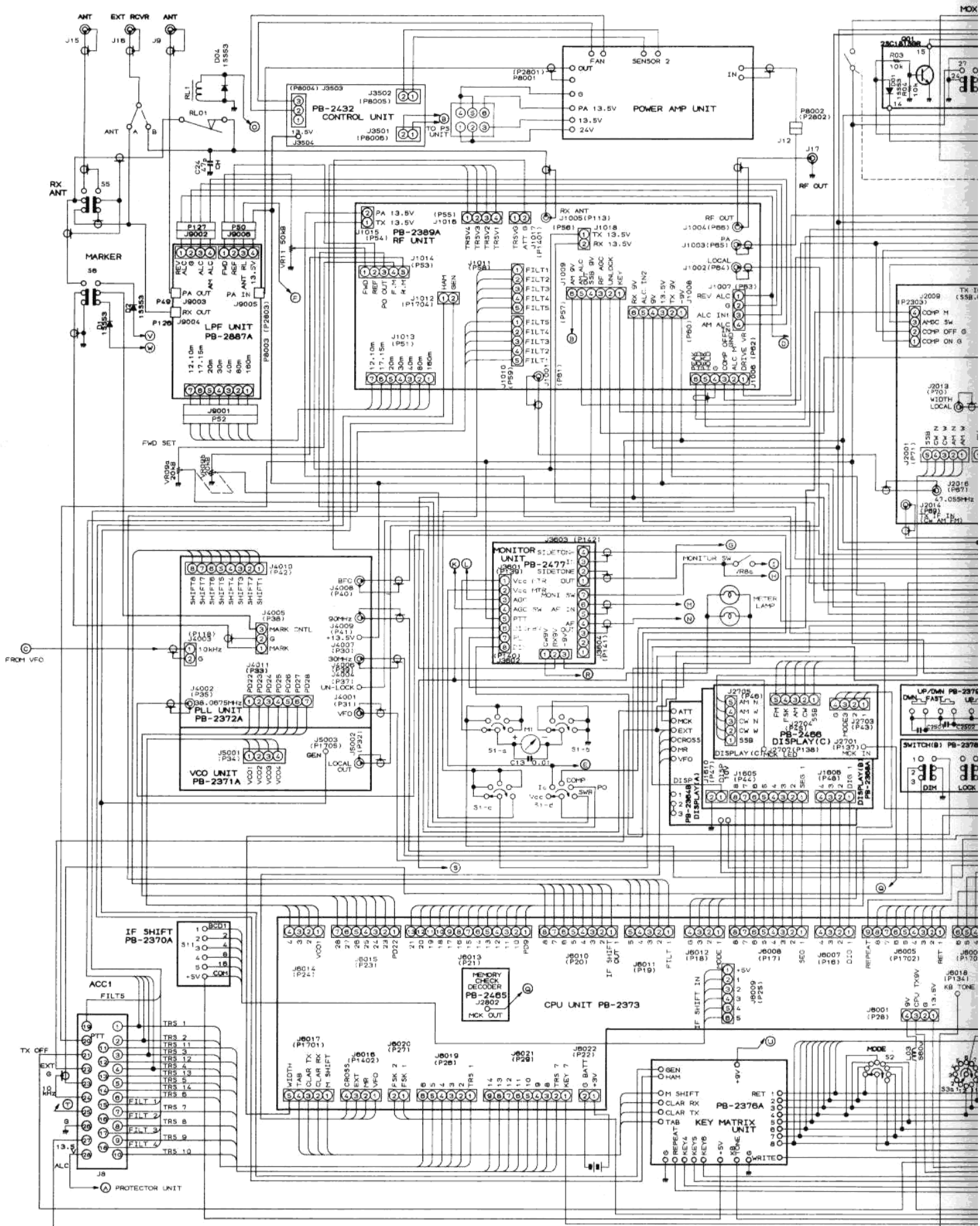
⑨ → Q1B  
MSL9  
DISP



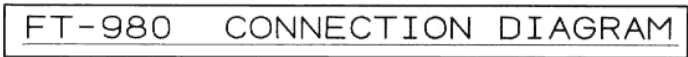


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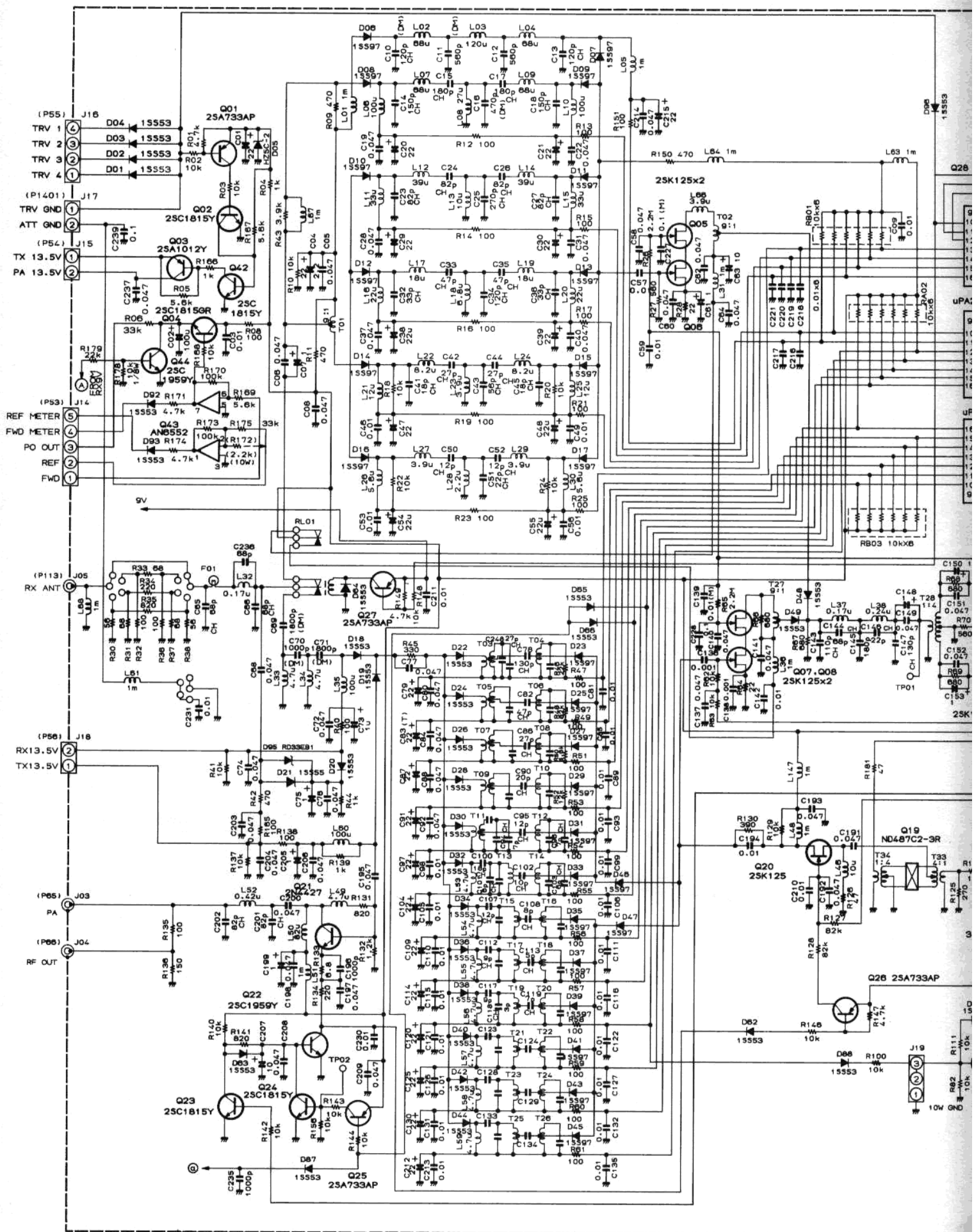
FT-980  
FREQUENCY RELATIONSHIPS

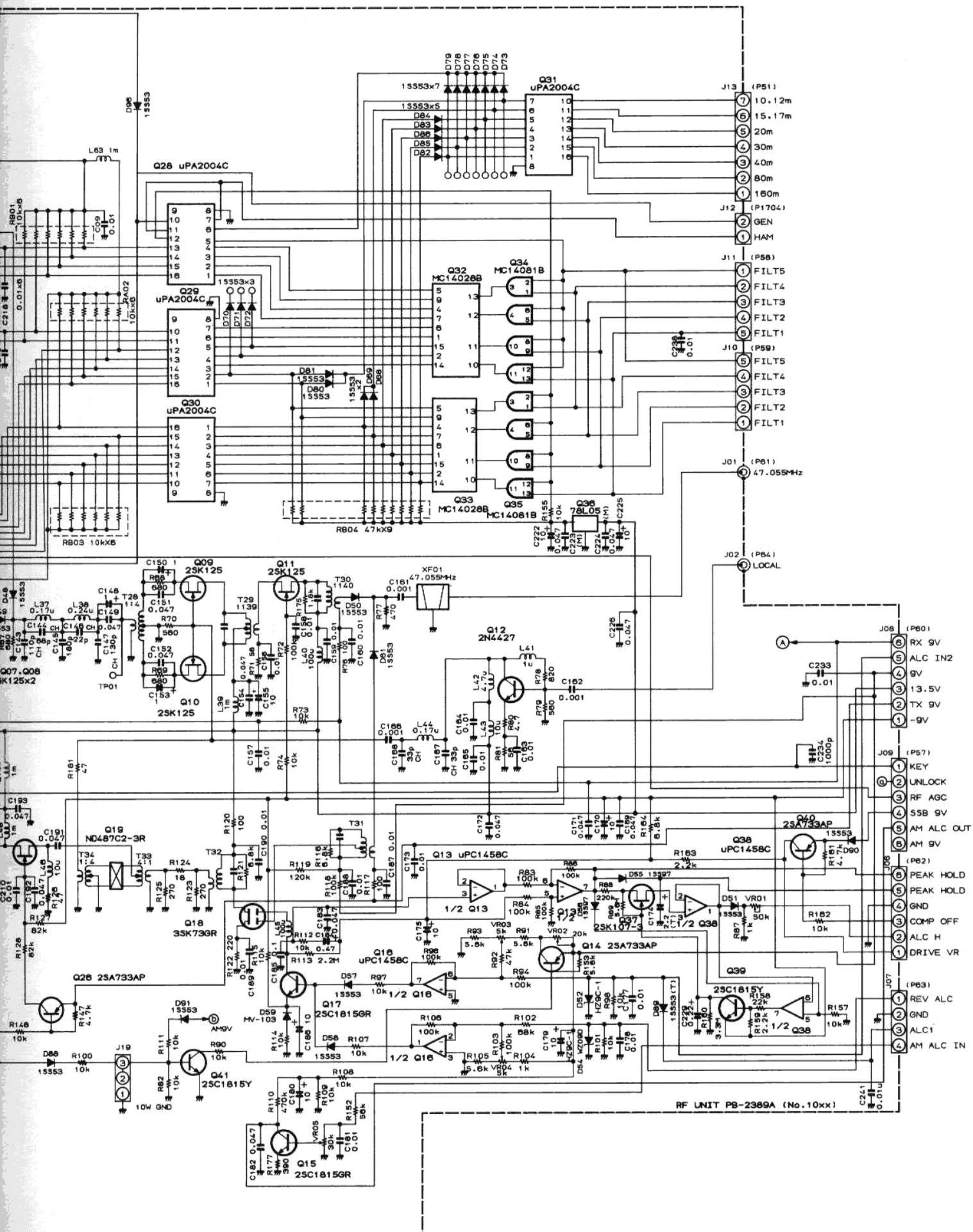


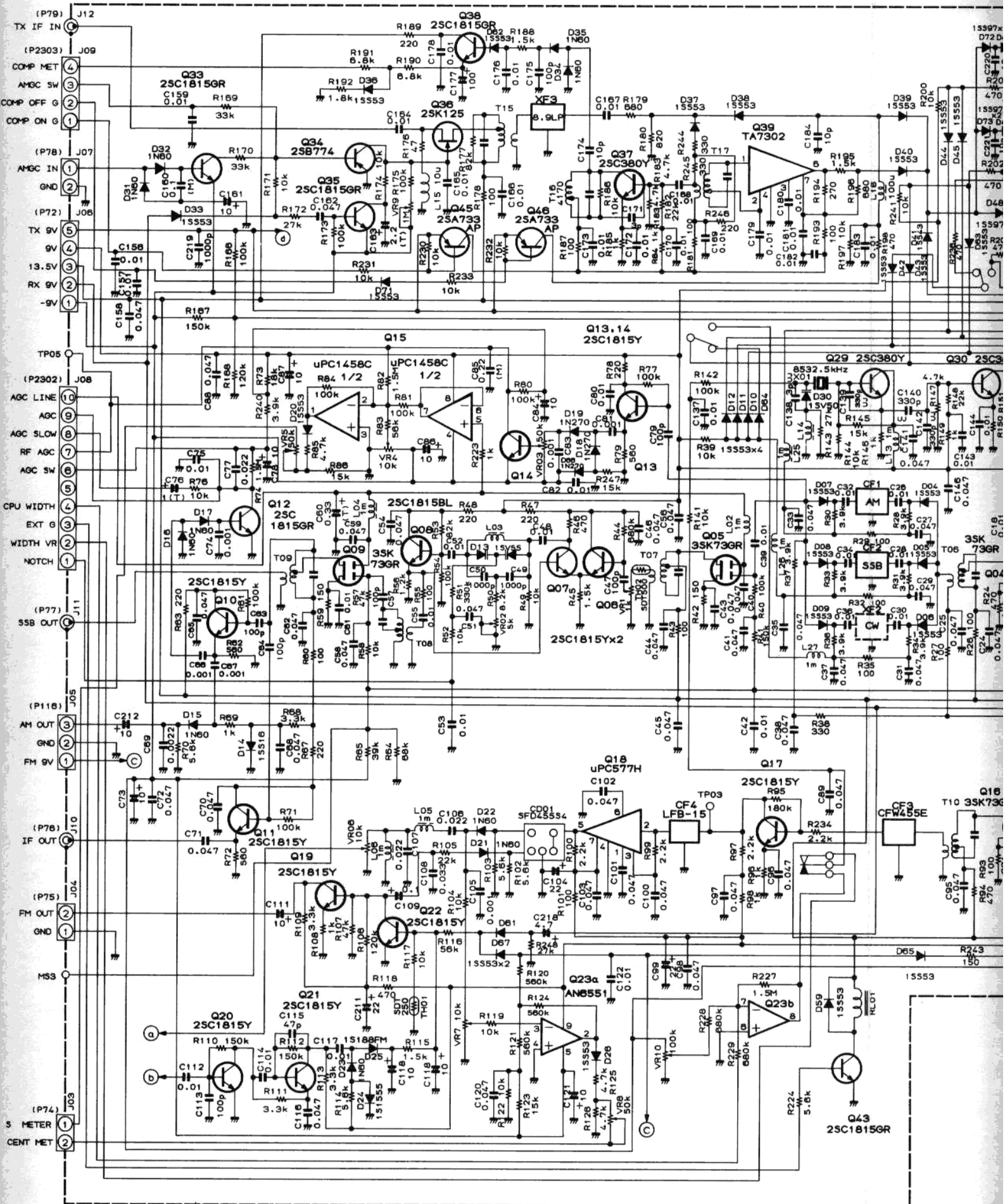




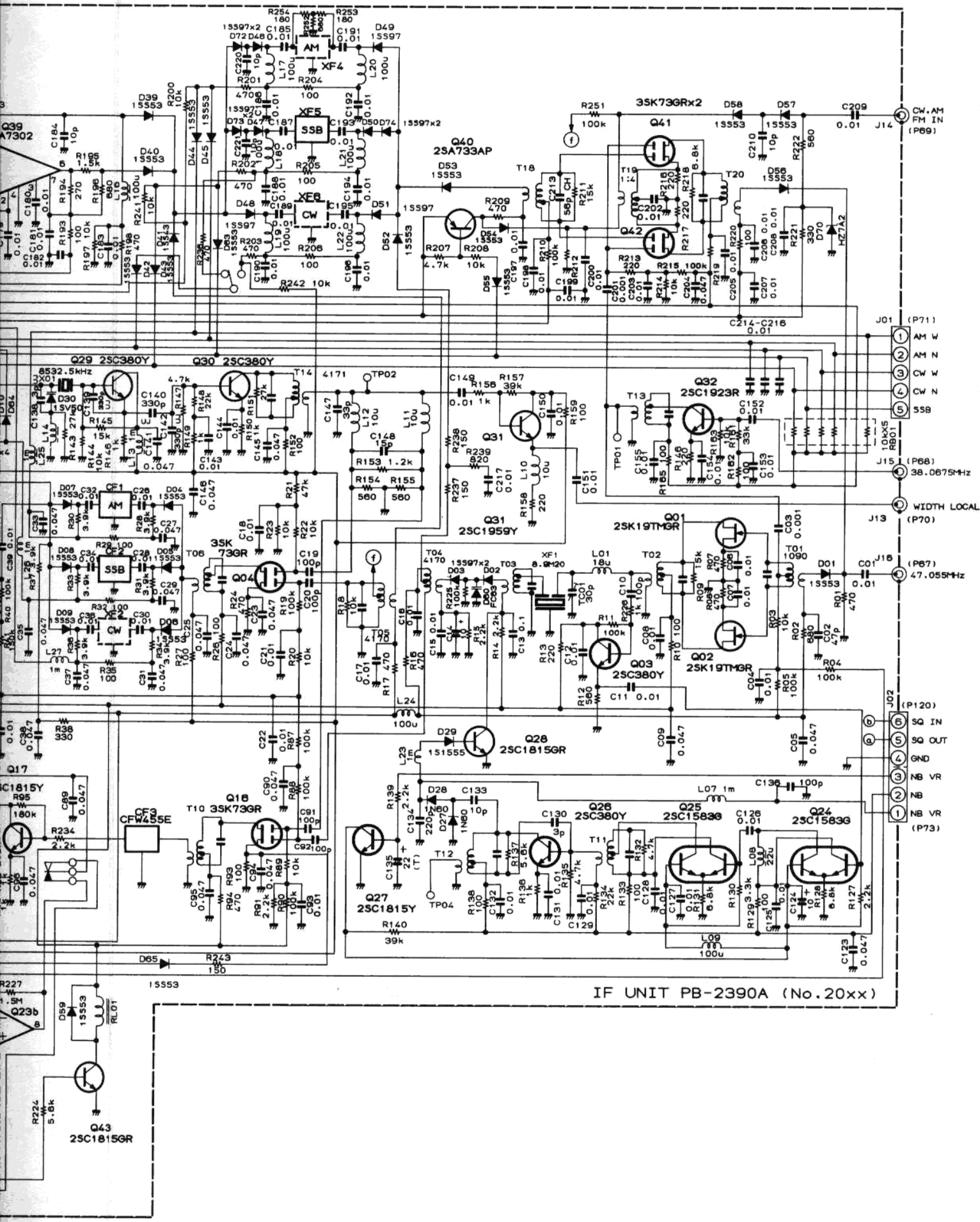




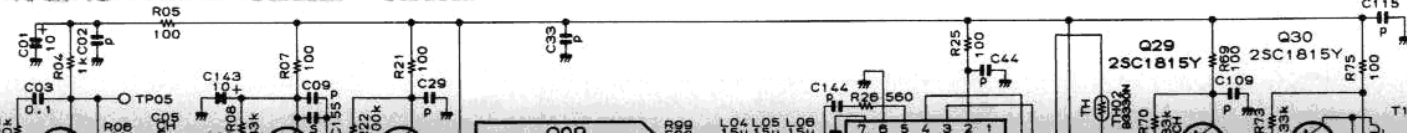


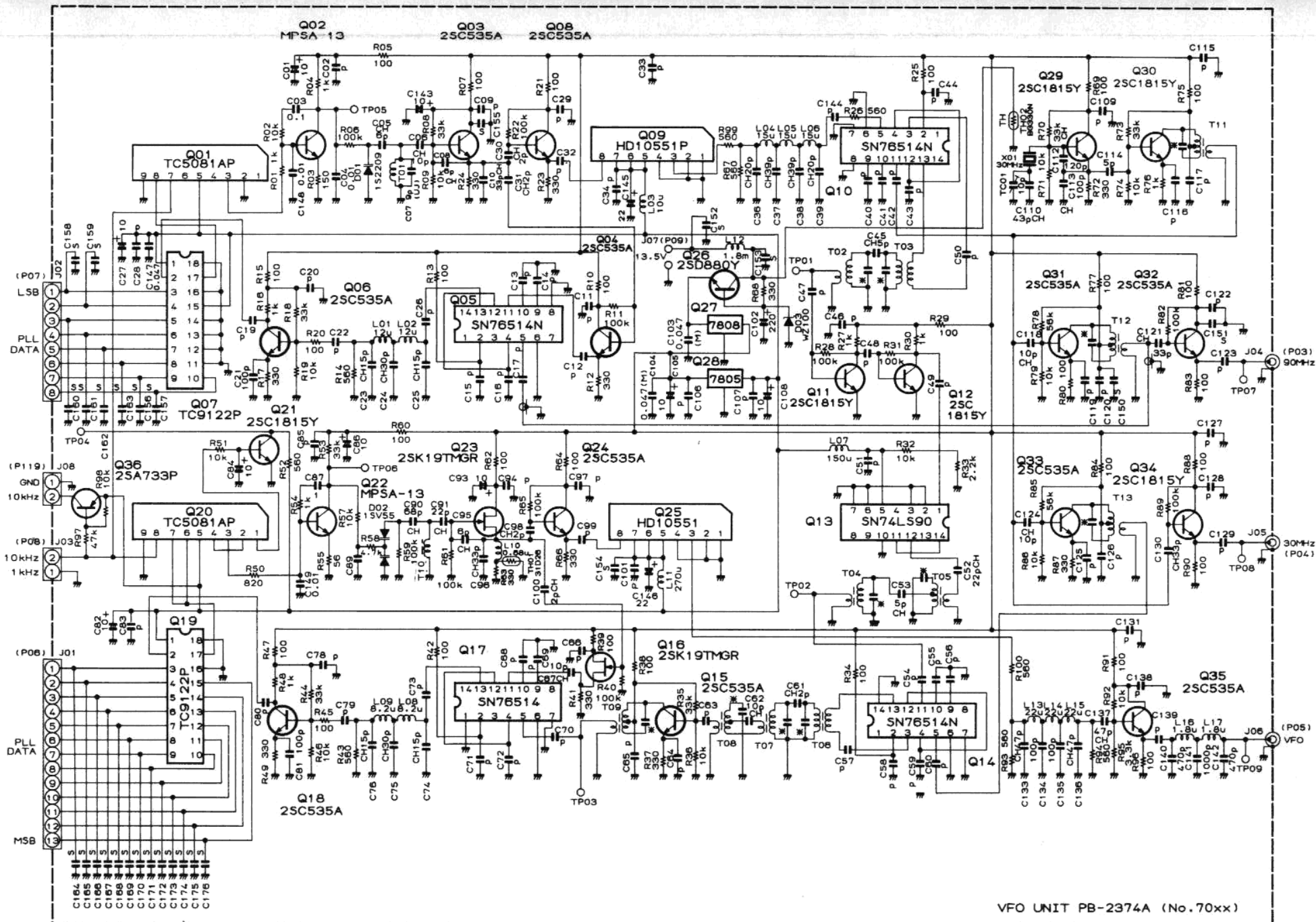




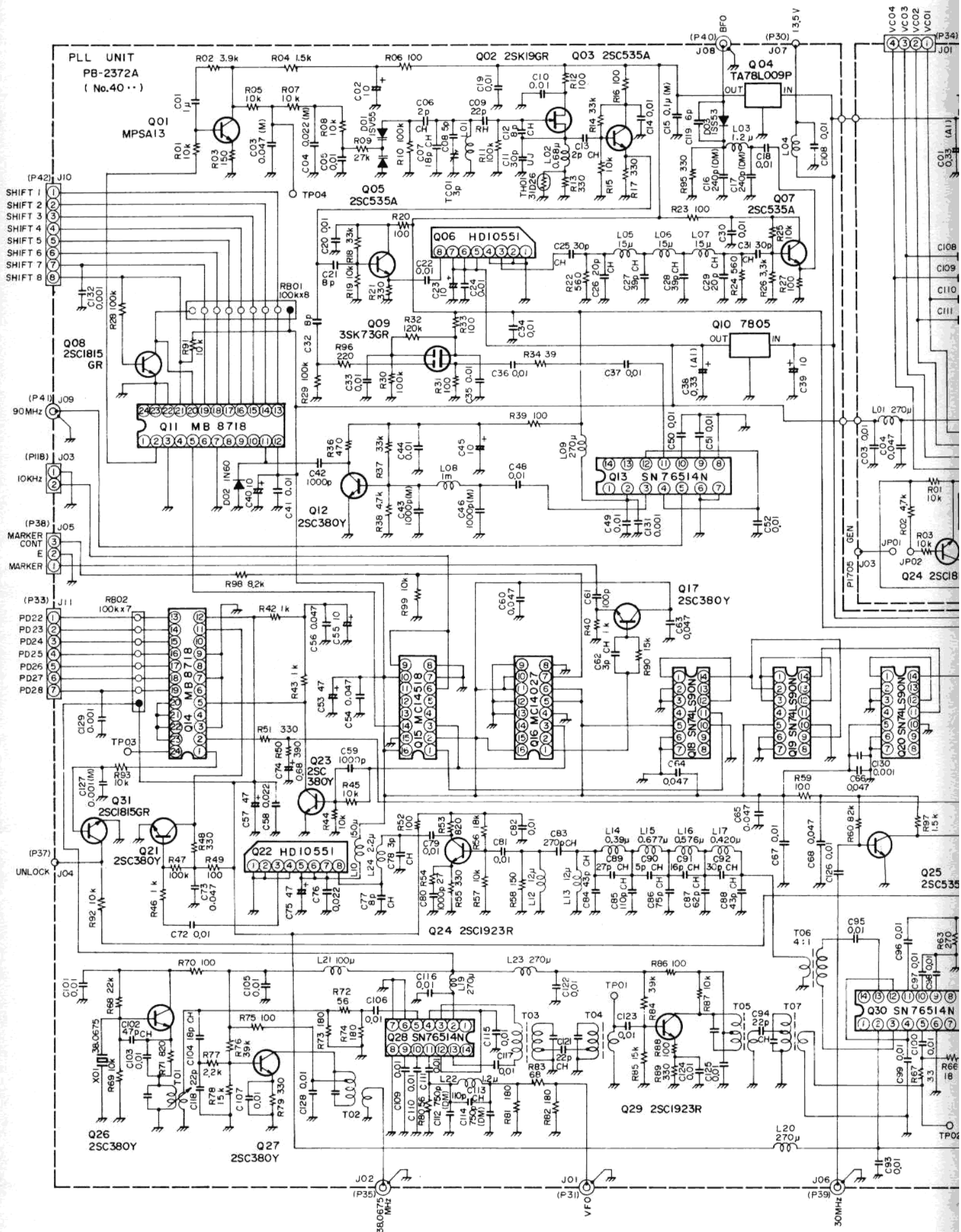


IF UNIT PB-2390A (No. 20xx)

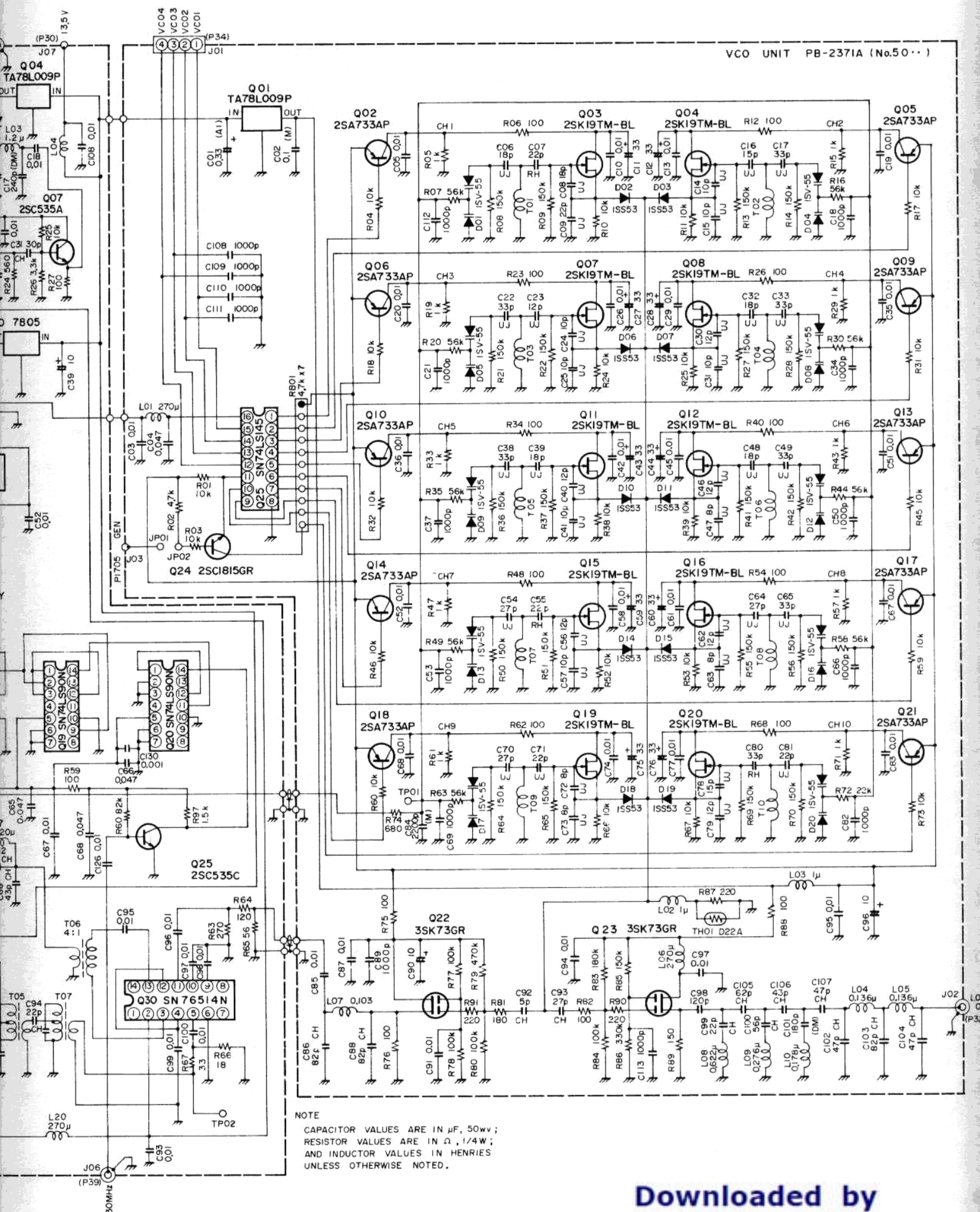


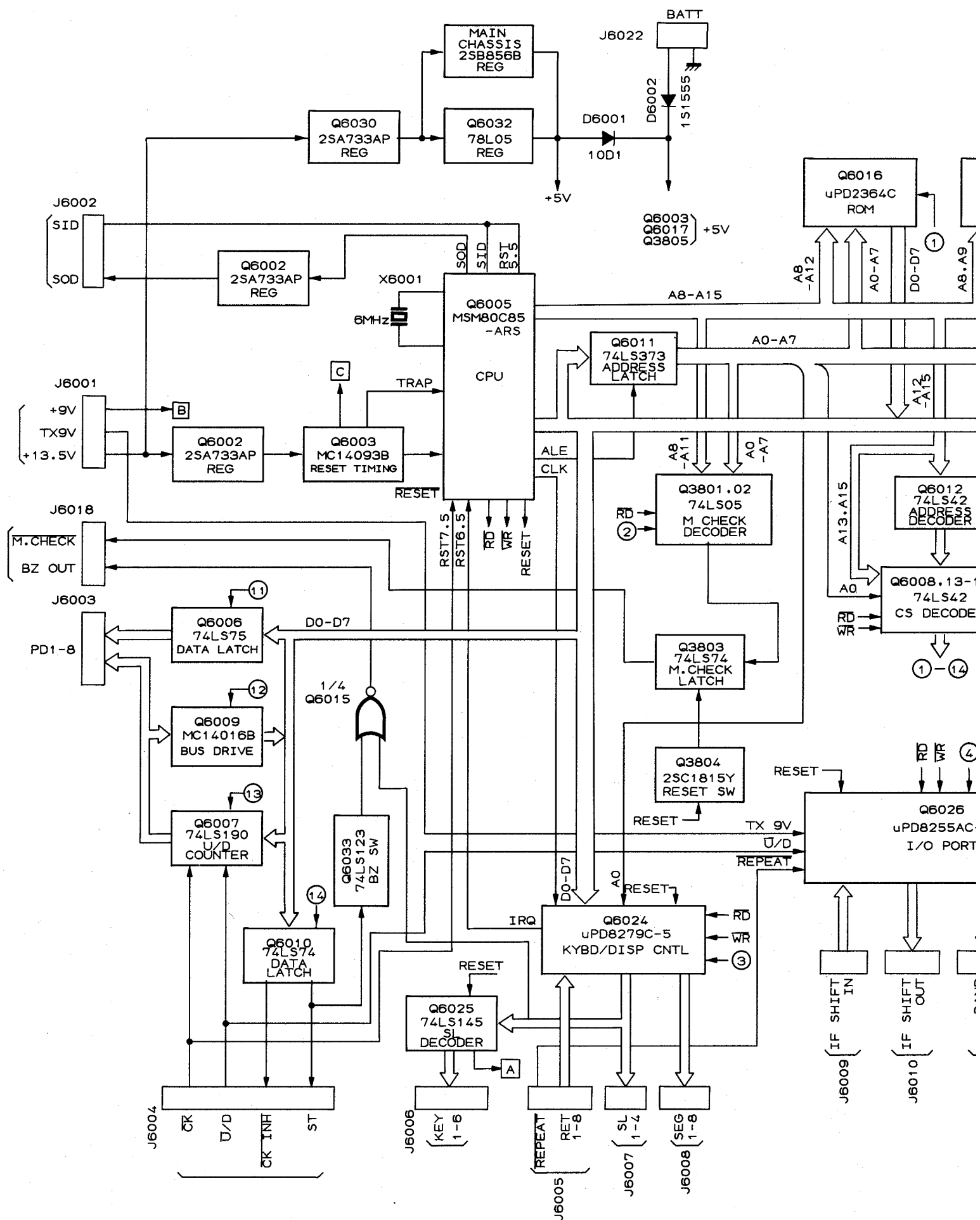


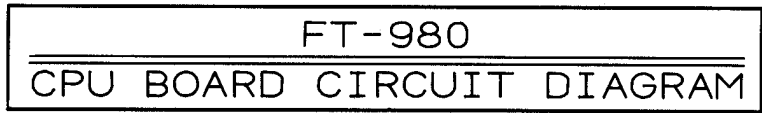
VFO UNIT PB-2374A (No. 70xx)

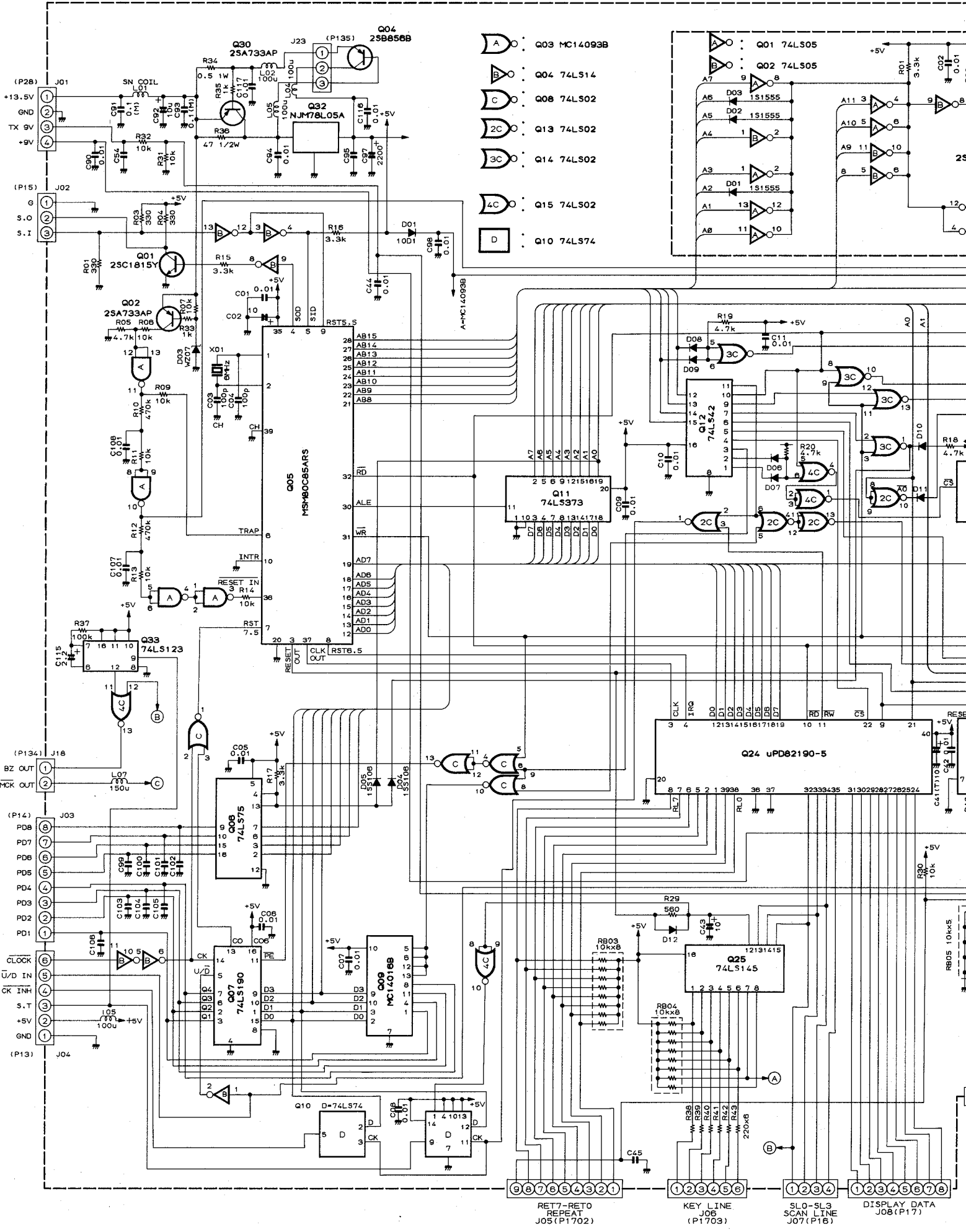




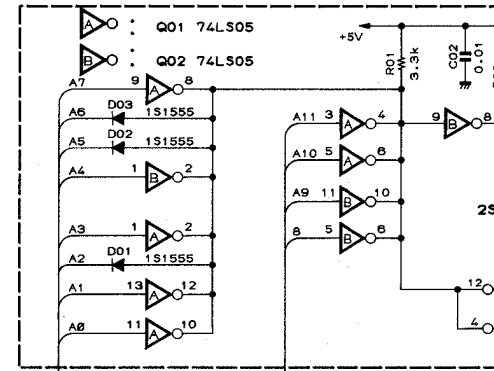


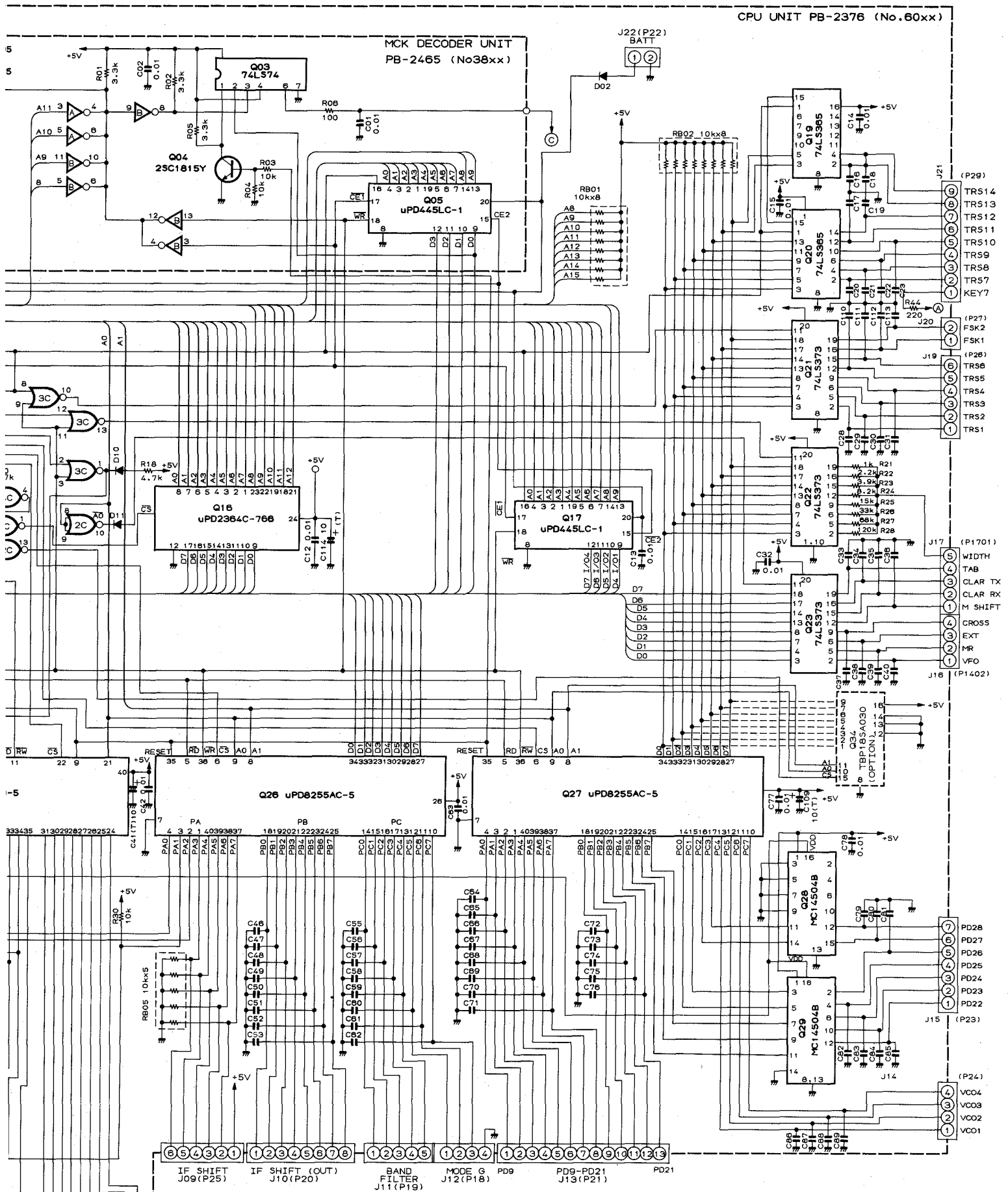




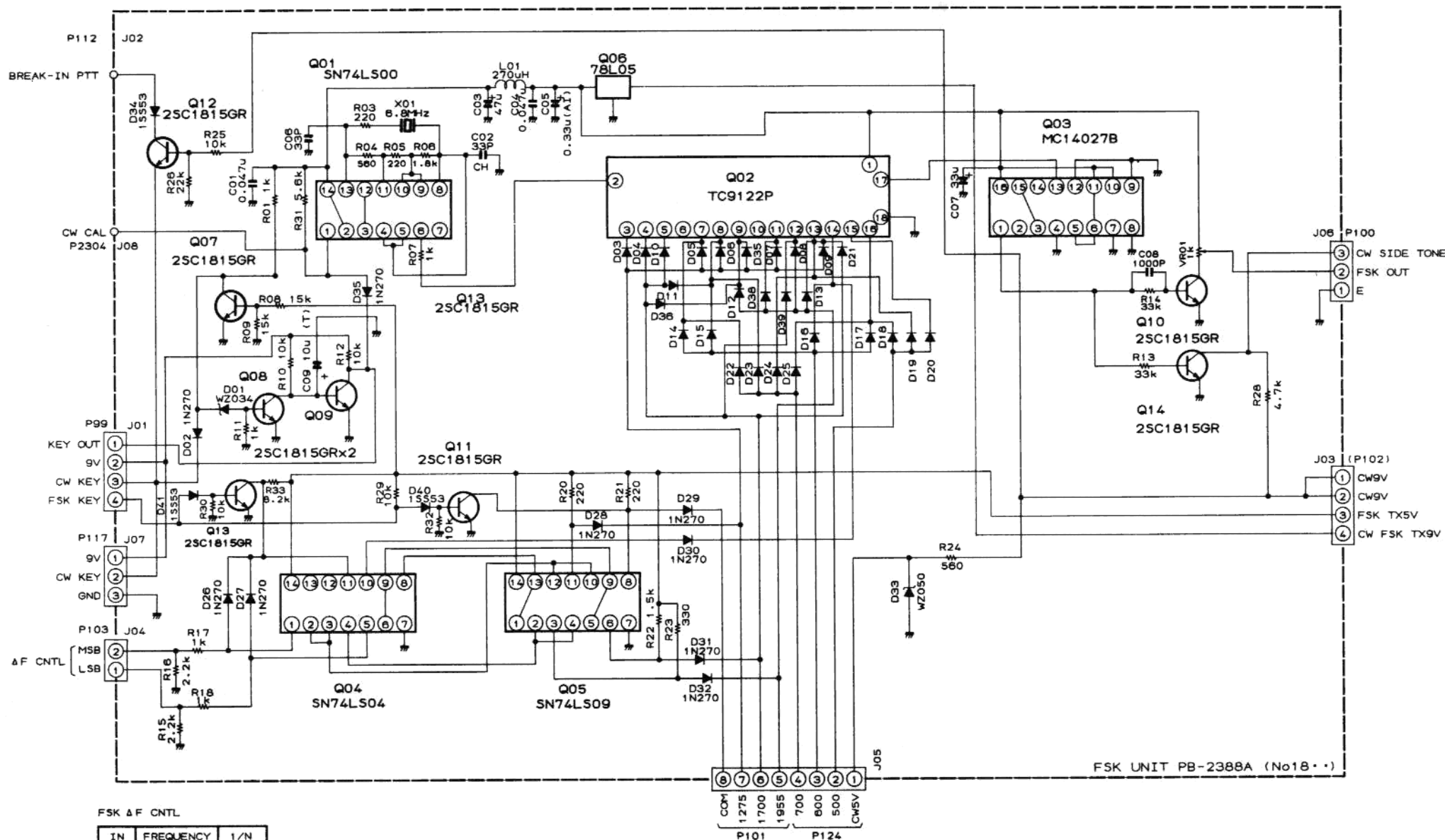


- Q03 MC14093B
- Q04 74LS14
- Q08 74LS02
- Q13 74LS02
- Q14 74LS02
- Q15 74LS02
- Q10 74LS74



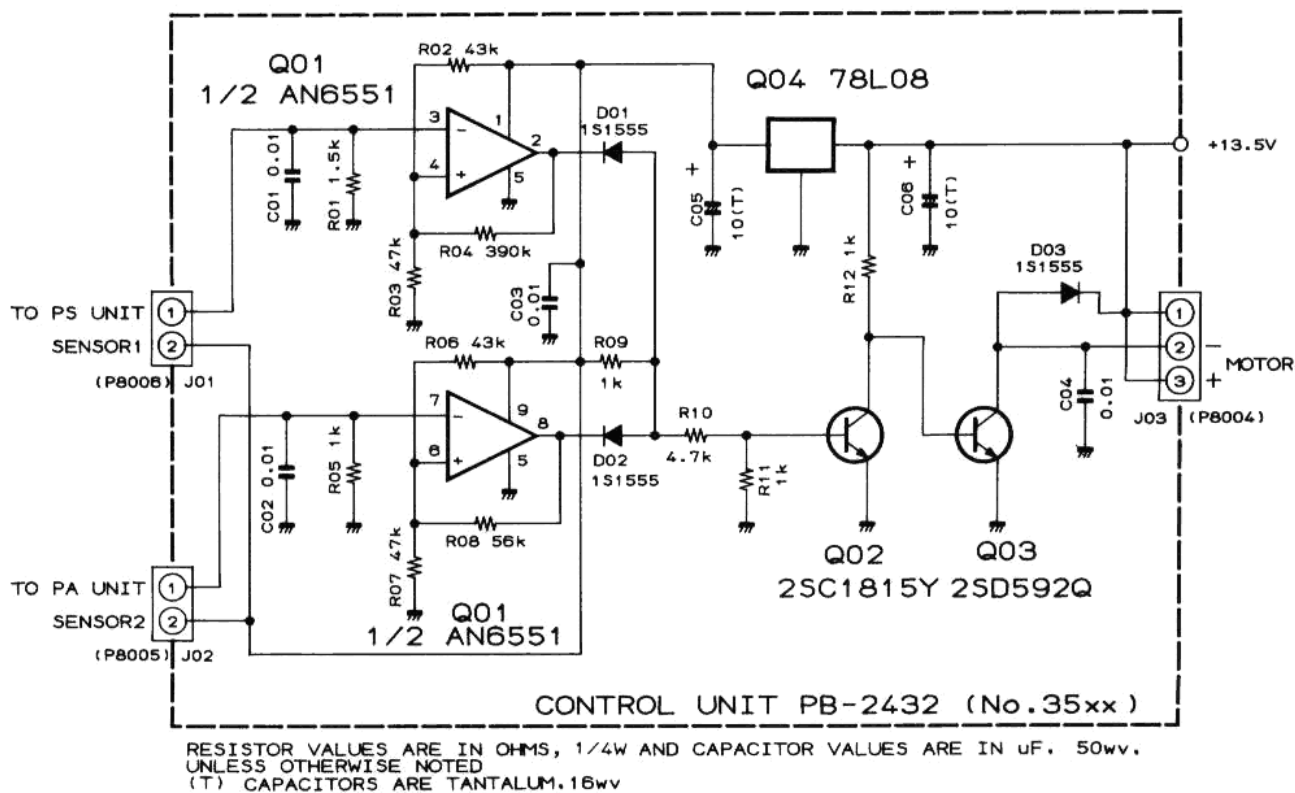
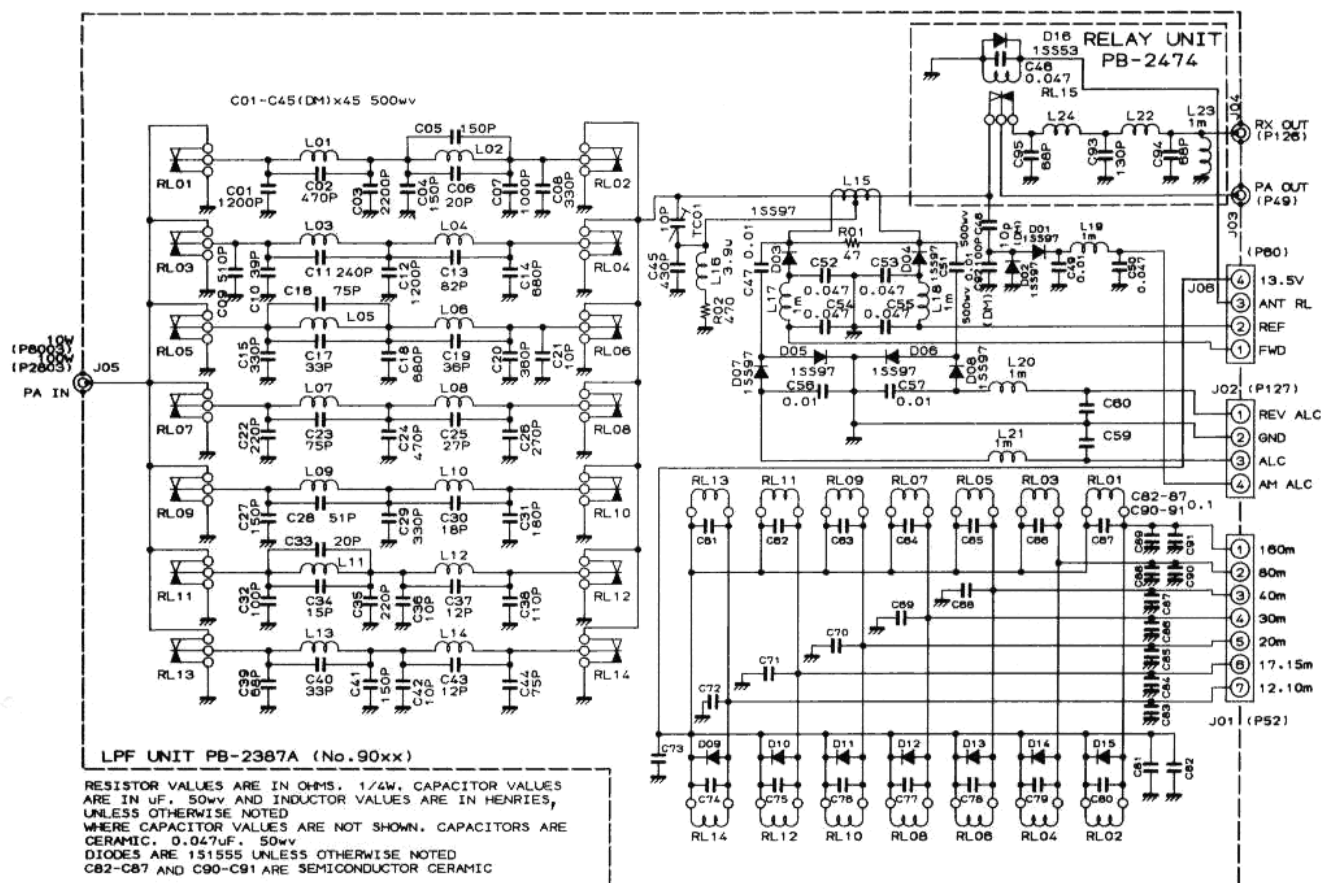






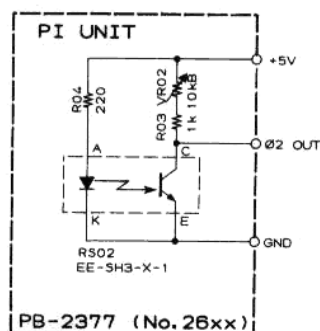
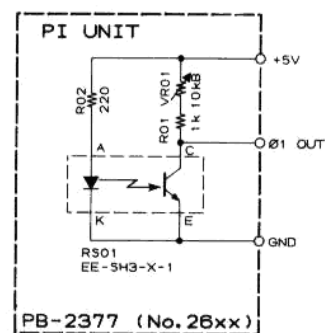
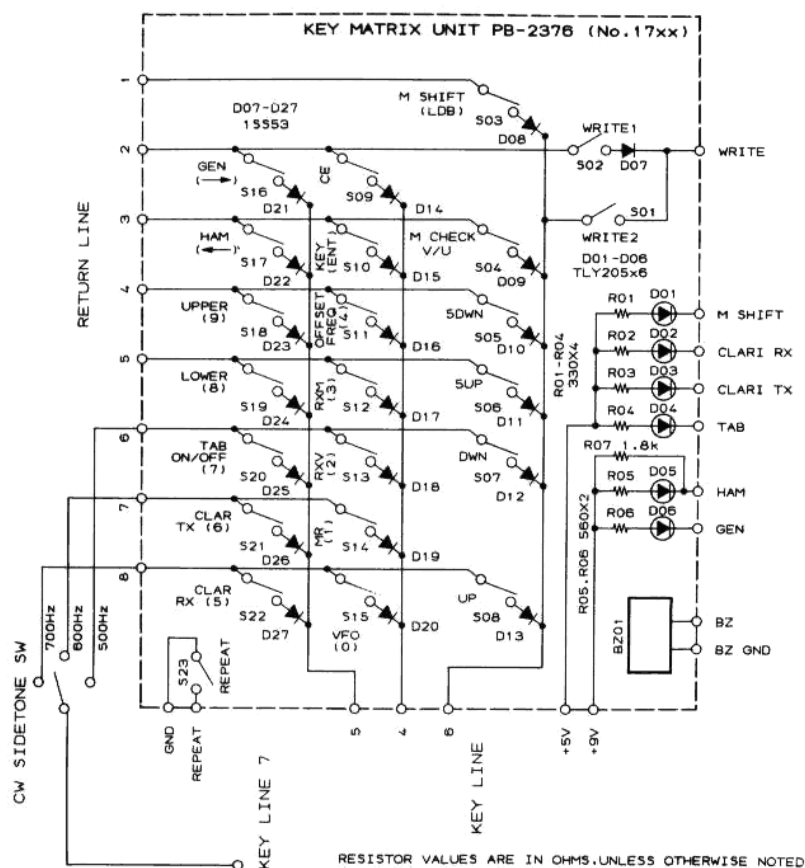
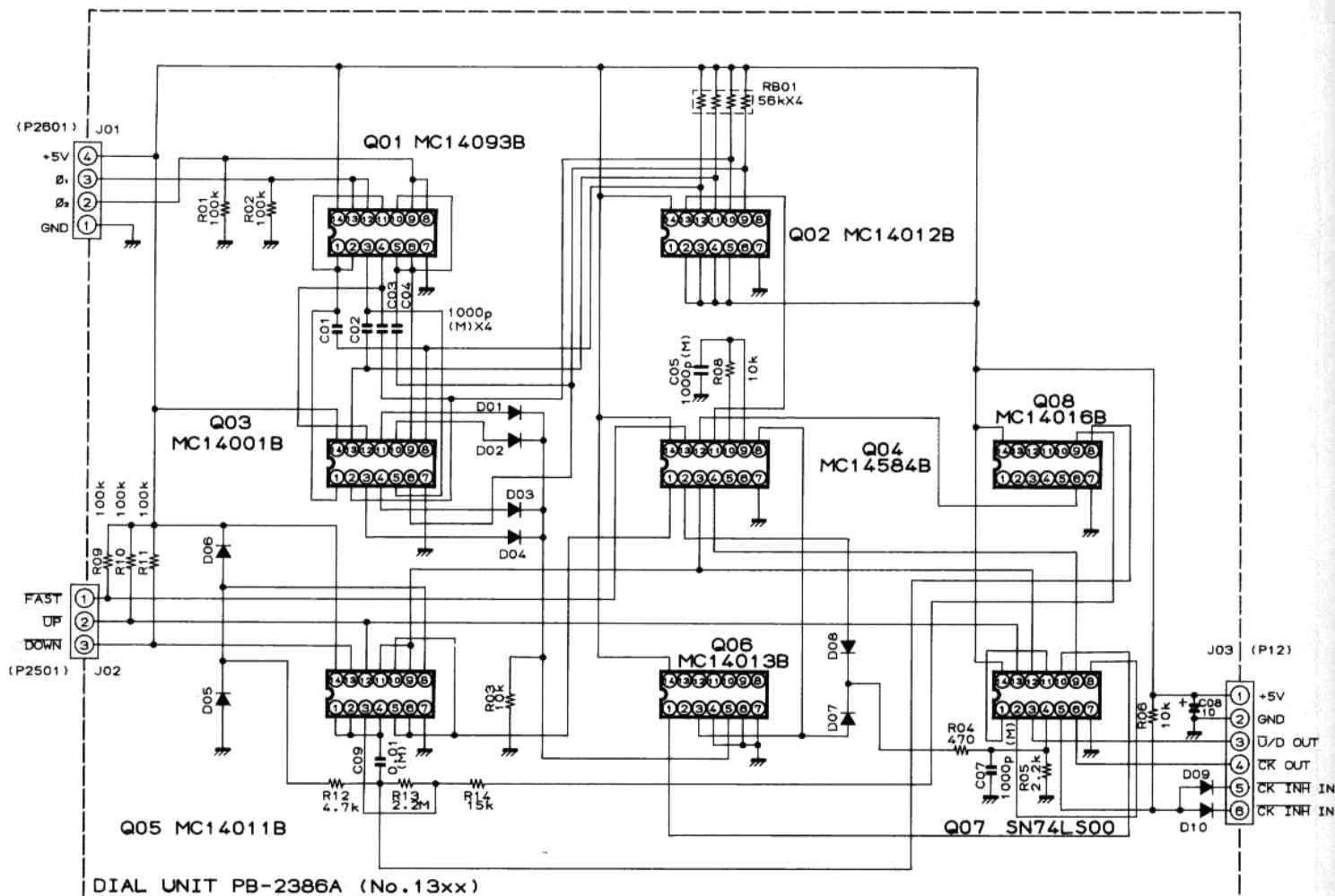
FSK & F CNTL

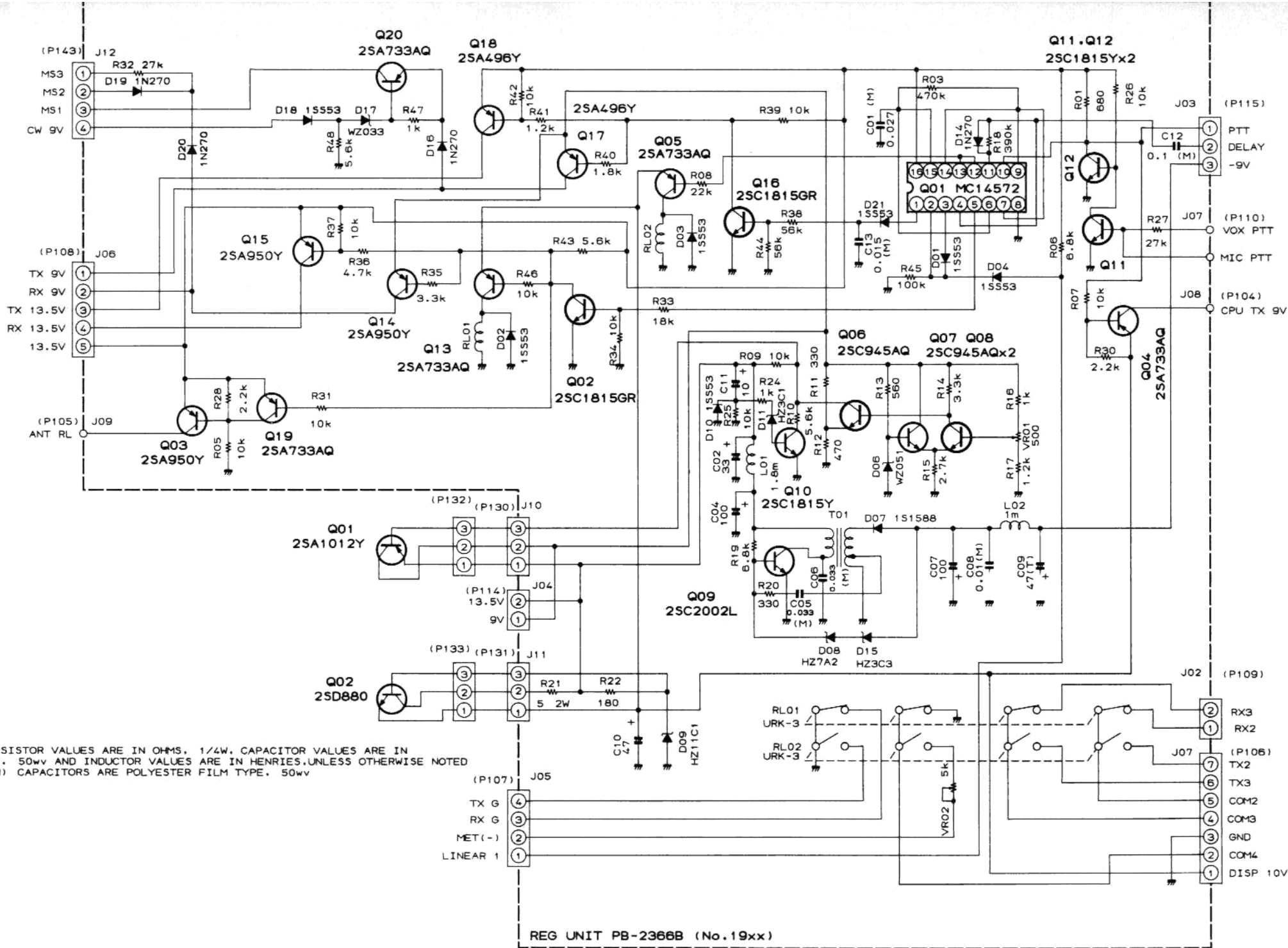
IN	FREQUENCY	1/N
0 0	RESET	
0 1	2550Hz	868
1 0	2975Hz	571
1 1	2295Hz	740
CW	500Hz	3400
	800Hz	2830
	700Hz	2430

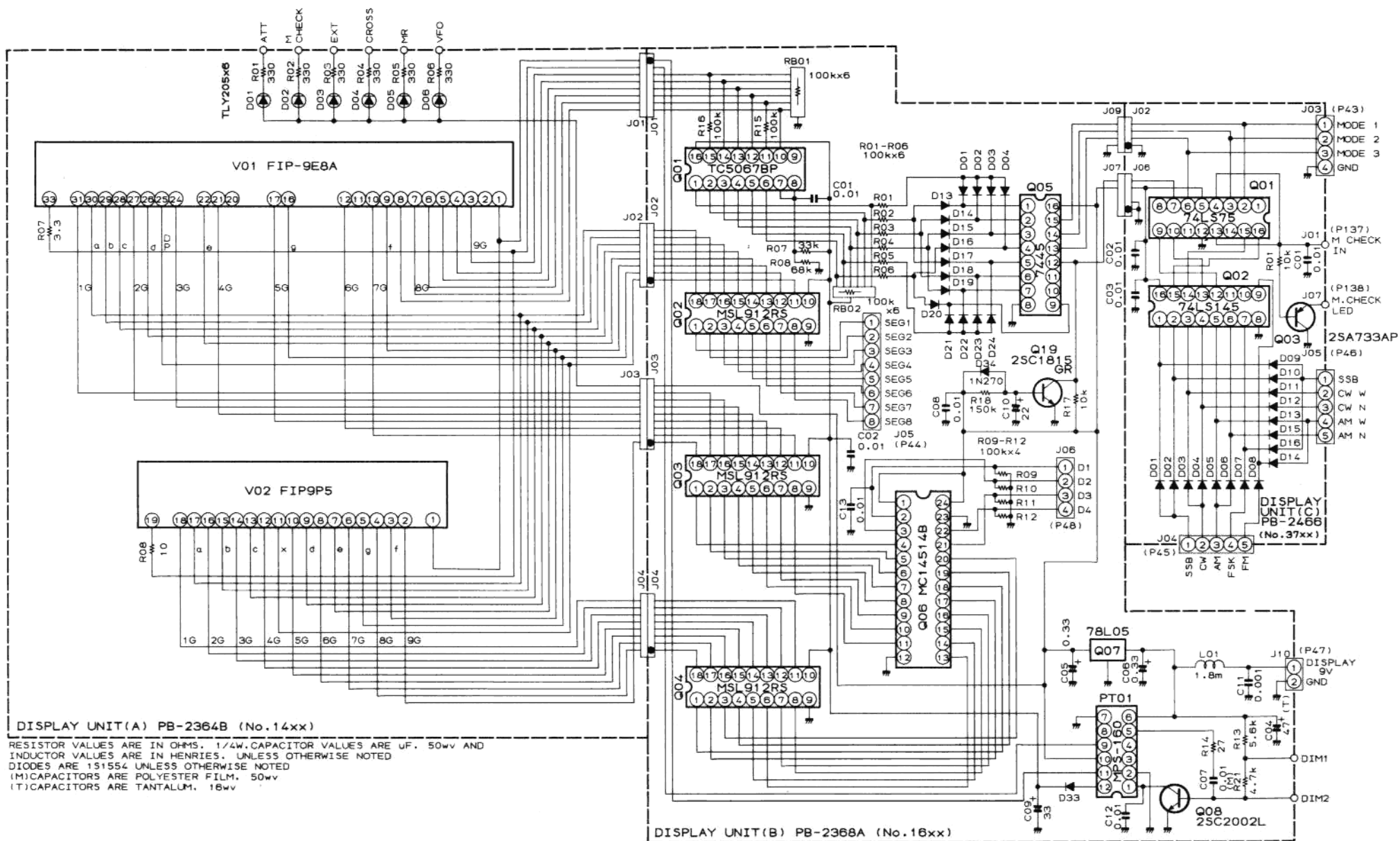


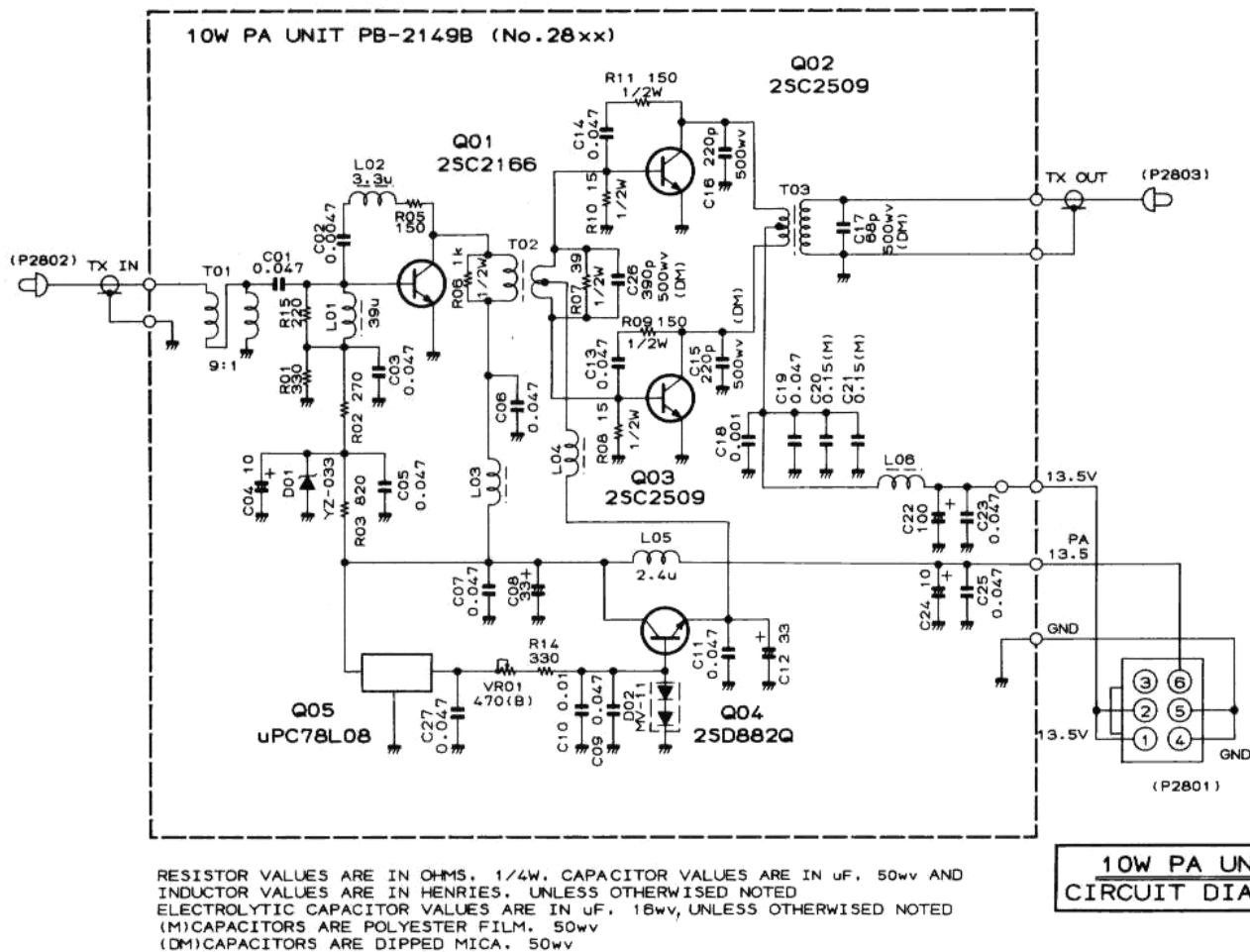
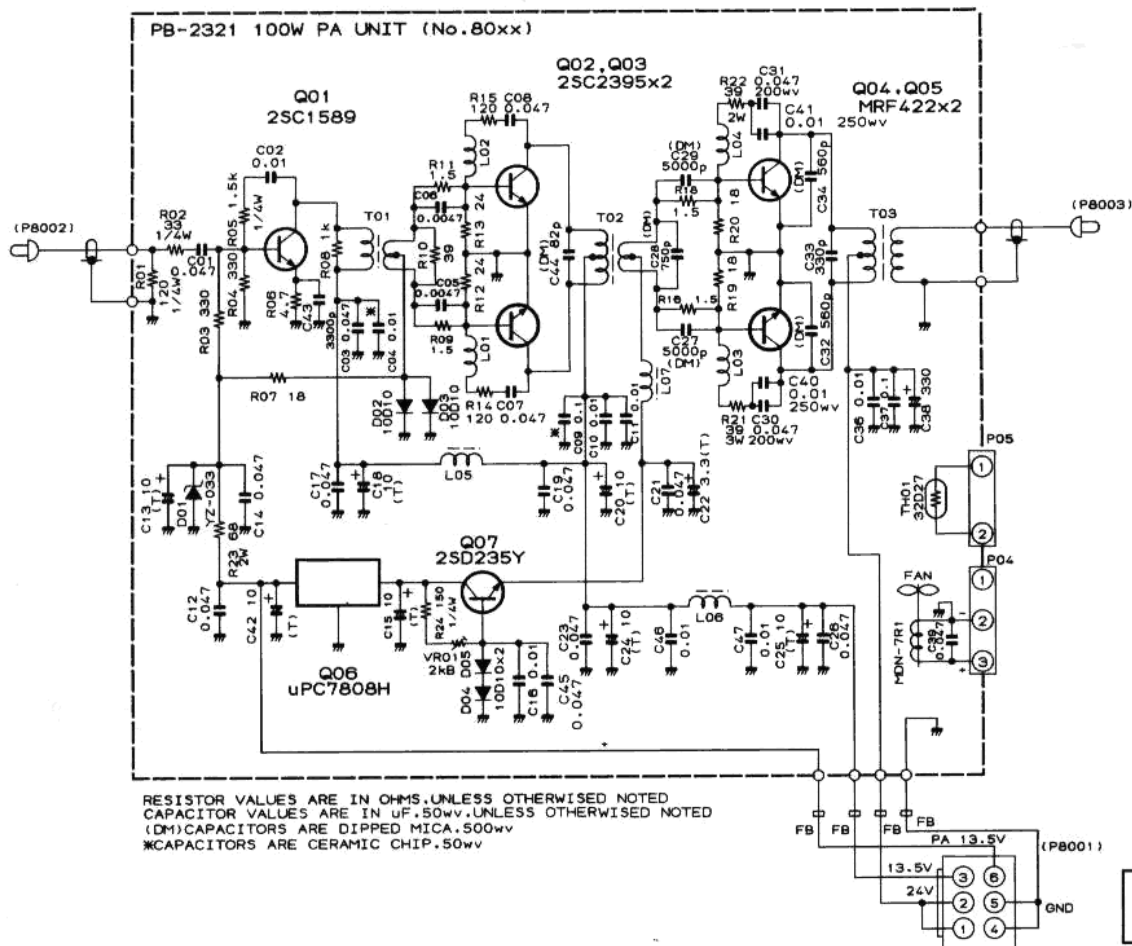




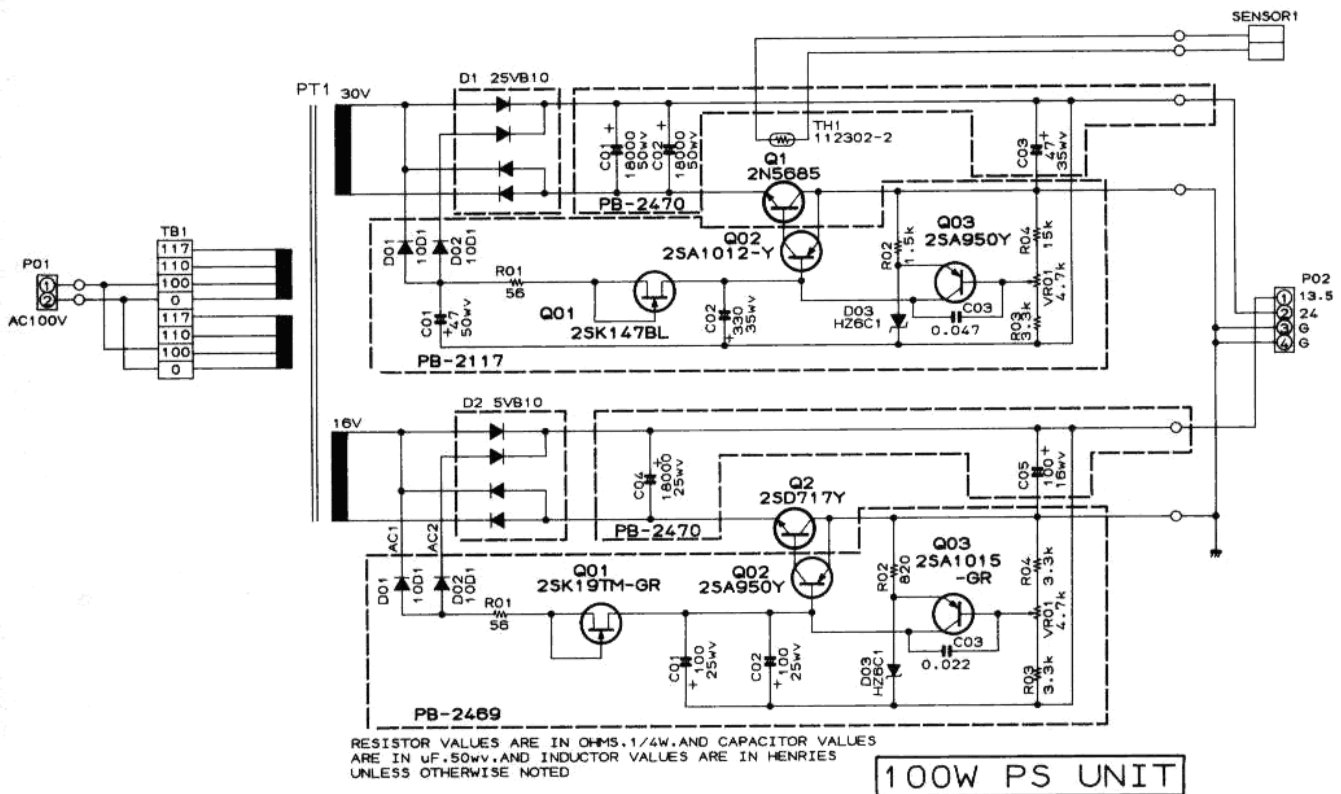












# COMPONENT APPLICATIONS

## MAIN CHASSIS

Part No.	Device	Type	Function
Q1	2SA1012Y	Transistor	Regulator (+9V Line)
Q2	2SC8800	"	" (Display Unit +9V Line)
Q3	μPC7808	IC	" (for Meter Lamp)
Q4	2SB856	Transistor	" (CPU Unit +5V Line)
D1	1SS53	Si Diode	Marker Control Switch
D2	"	"	"
D3	"	"	CW Full Break-in Switch
D4	"	"	Back Pulse Cancelling

## RF UNIT

Part No.	Device	Type	Function
Q1001	2SA733AP	Transistor	TX PA Disable Switch
Q1002	2SC1815Y	"	"
Q1003	2SA1012Y	"	"
Q1004	2SC1815GR	"	TX PO Meter Amplifier
Q1005	2SK125	JFET	RX RF Amplifier (GEN)
Q1006	"	"	" ( " )
Q1007	"	"	" (HAM)
Q1008	"	"	" ( " )
Q1009	"	"	RX 1st Mixer
Q1010	"	"	"
Q1011	"	"	RX Post Amplifier
Q1012	2N4427	Transistor	RX 1st Local (TX 2nd Local) Amplifier
Q1013	μPC1458C	IC	TX ALC Meter Amplifier
Q1014	2SA733AP	Transistor	TX Power Controller (AM, 10m)
Q1015	2SC1815GR	"	TX AM ALC Amplifier
Q1016	μPC1458C	IC	TX ALC Amplifier
Q1017	2SC1815GR	Transistor	"
Q1018	3SK73GR	MOS FET	TX 1st IF Amplifier
Q1019	ND487C2-3R	IC (Ring Module)	TX 2nd Mixer
Q1020	2SK125	JFET	TX RF Amplifier
Q1021	2N4427	Transistor	TX Predriver Amplifier
Q1022	2SC1959Y	"	TX Predriver (Q1021) Bias Switch
Q1023	2SC1815Y	"	KEY Switch
Q1024	"	"	TX Unlock Switch
Q1025	2SA733AP	"	"
Q1026	"	"	TX RF Amplifier (Q1020) Bias Switch
Q1027	"	"	Relay Driver [GEN/HAM Relay (RL1001)]
Q1028	μPA2004C	IC	Driver Array (for GEN/HAM Relay, GEN BPF Selector)
Q1029	"	"	" (HAM BPF Selector)
Q1030	"	"	" ( " )
Q1031	"	"	" [LPF Relay (RL9001-9014) Driver]
Q1032	MC14028B	"	Decoder (Filter Selector)
Q1033	"	"	" ( " )
Q1034	MC14081B	"	AND Gate ( " )
Q1035	"	"	" ( " )
Q1036	μPC78L05	"	Regulator (for Filter Select Logic Circuit)

Q1037	2SK107-3	JFET	TX ALC Meter Peak Hold Controller
Q1038	μPC1458C	IC	TL ALC Meter Amplifier and TX ALC Meter Peak Hold Controller
Q1039	2SC1815Y	Transistor	TX ALC Meter Peak Hold Controller
Q1040	2SA733AP	"	TX DRIVE Level Controller (SSB, PROC. ON)
Q1041	2SC1815Y	"	TX Power Controller (AM, 10m BAND)
Q1042	"	"	TX PA Disable Switch
Q1043	AN6552	IC	TX FWD, REF Meter Amplifier
D1001	1SS53	Si Diode	Diode OR (for Transverter Control at ACC-1)
D1002	"	"	"
D1003	"	"	"
D1004	"	"	"
D1005	HZ5C-2	Zener Diode	Regulator [for TX PA Disable Switch (Q1001)]
D1006	1SS97	Schottky Barrier Di.	BPF Switch (GEN, 0.15–1 MHz)
D1007	"	"	" ( " )
D1008	"	"	" (GEN, 1–2 MHz)
D1009	"	"	" ( " )
D1010	"	"	" (GEN, 2–4 MHz)
D1011	"	"	" ( " )
D1012	"	"	" (GEN, 4–8 MHz)
D1013	"	"	" ( " )
D1014	"	"	" (GEN, 8–16 MHz)
D1015	"	"	" ( " )
D1016	"	"	" (GEN, 16–30 MHz)
D1017	"	"	" ( " )
D1018	1SS53	Si Diode	Diode OR (RX ON)
D1019	"	"	" (TX ON)
D1020	"	"	" (RX ON)
D1021	1SS55	"	" (TX ON)
D1022	1SS53	"	BPF Switch (HAM, 160m)
D1023	1SS97	Schottky Barrier Di.	" ( " )
D1024	1SS53	Si Diode	" (HAM, 80m)
D1025	1SS97	Schottky Barrier Di.	" ( " )
D1026	1SS53	Si Diode	" (HAM, 40m)
D1027	1SS97	Schottky Barrier Di.	" ( " )
D1028	1SS53	Si Diode	" (HAM, 30m)
D1029	1SS97	Schottky Barrier Di.	" ( " )
D1030	1SS53	Si Diode	" (HAM, 20m)
D1031	1SS97	Schottky Barrier Di.	" ( " )
D1032	1SS53	Si Diode	" (HAM, 17m)
D1033	1SS97	Schottky Barrier Di.	" ( " )
D1034	1SS53	Si Diode	" (HAM, 15m)
D1035	1SS97	Schottky Barrier Di.	" ( " )
D1036	1SS53	Si Diode	" (HAM, 12m)
D1037	1SS97	Schottky Barrier Di.	" ( " )
D1038	1SS53	Si Diode	" (HAM, 10m)
D1039	1SS97	Schottky Barrier Di.	" ( " )
D1040	1SS53	Si Diode	" (HAM, AUX)
D1041	1SS97	Schottky Barrier Di.	" ( " )
D1042	1SS53	Si Diode	" ( " )
D1043	1SS97	Schottky Barrier Di.	" ( " )
D1044	1SS53	Si Diode	" ( " )
D1045	1SS97	Schottky Barrier Di.	" ( " )
D1046	"	"	" (HAM, 160–17m)
D1047	"	"	" (HAM, 15–10m, AUX)
D1048	1SS53	Si Diode	GEN/HAM Selector (GEN)
D1049	"	"	" (HAM)

D1050	1SS53	Si Diode	T/R Switch (RX ON)
D1051	"	"	Reverse Voltage Protector (for Q1038)
D1052	HZ9C1	Zener Diode	TX ALC Clipper
D1053	Not Used		
D1054	HZ9C1	Zener Diode	TX REV ALC Clipper
D1055	1SS97	Schottky Barrier Di.	ALC Meter Peak Hold Switch
D1056	"	"	"
D1057	1SS53	Si Diode	Switch (TX FWD ALC)
D1058	"	"	" (TX REV ALC)
D1059	MV103	Varistor Diode	Temperature Compensator (for TX ALC Amplifier Q1017)
D1060	Not Used		
D1061	1SS53	Si Diode	T/R Switch (TX ON)
D1062	"	"	TX RF Amplifier (Q1020) Bias Switch
D1063	"	"	TX Predriver Bias Switch (Q1022) Delay Control
D1064	"	"	Reverse Voltage Protector (for Q1027)
D1065	"	"	12m TX Disable Switch
D1066	"	"	17m TX Disable Switch
D1067	Not Used		
D1068	1SS53	Si Diode	Diode Matrix (Filter Select Data)
}			
D1086	1SS53	Si Diode	Diode Matrix (Filter Selector Data)
D1087	"	"	TX Unlock Switch
D1088	"	"	
D1089	"	"	Switch (TX ALC 1 Line)
D1090	"	"	Compensation for Q1040
D1091	"	"	TX AM ALC Switch
D1092	"	"	Reverse Voltage Protector (for Q1043)
D1093	"	"	" ( " )
XF1001	XF-47JX	Crystal Filter	RX 1st IF Filter, TX 2nd IF Filter

## IF UNIT

Part No.	Device	Type	Function
Q2001	2SK19TM-GR	JFET	RX 2nd Mixer
Q2002	"	"	"
Q2003	2SC380Y	Transistor	RX NB Buffer Amplifier
Q2004	3SK73GR	MOS FET	RX 3rd Mixer (SSB, AM, CW, FSK)
Q2005	"	"	RX 3rd IF Amplifier ( " )
Q2006	2SC1815Y	Transistor	RX Q Multiplier
Q2007	"	"	"
Q2008	2SC1815BL	"	RX 3rd IF Buffer Amplifier
Q2009	3SK73GR	MOS FET	RX 3rd IF Amplifier (SSB, AM, CW, FSK)
Q2010	2SC1815Y	Transistor	RX 3rd IF Buffer Amplifier (AM, 3rd IF AGC)
Q2011	"	"	"
Q2012	2SC1815GR	"	RX 3rd IF AGC Controller
Q2013	2SC1815Y	"	RX 3rd IF Buffer Amplifier (RF AGC)
Q2014	"	"	RX RF AGC Controller
Q2015	μPC1458C	IC	RX S-Meter Amplifier
Q2016	3SK73GR	MOS FET	RX 3rd Mixer (for FM)
Q2017	2SC1815Y	Transistor	RX 3rd IF Amplifier ( " )
Q2018	μPC577H	IC	" ( " )



Q2019	2SC1815Y	Transistor	RX AF Amplifier (FM)
Q2020	"	"	RX FM SQL Amplifier
Q2021	"	"	"
Q2022	"	"	RX FM SQL Switch
Q2023	AN6551	IC	RX FM Center Meter DC Amplifier and RX WIDTH Controller (for EXT Control)
Q2024	2SC1583G	Transistor	RX NB Amplifier
Q2025	"	"	"
Q2026	2SC380Y	"	"
Q2027	2SC1815Y	"	RX NB AGC Amplifier
Q2028	2SC1815GR	"	RX NB Switch
Q2029	2SC380Y	"	RX WIDTH VCXO
Q2030	"	"	RX WIDTH Buffer Amplifier
Q2031	2SC1959Y	"	"
Q2032	2SC1923R	"	RX 2nd Local (TX 1st Local) Amplifier
Q2033	2SC1815GR	"	TX AMGC Switch
Q2034	2SB774	"	"
Q2035	2SC1815GR	"	"
Q2036	2SK125	JFET	TX AMGC Controller
Q2037	2SC380Y	Transistor	TX 1st IF Amplifier (for COMP Meter)
Q2038	2SC1815GR	"	TX COMP Meter DC Amplifier
Q2039	TA7302P	IC	TX 1st IF Limiter Amplifier (PROC ON)
Q2040	2SA733AP	Transistor	TX 1st IF Filter Switch (SSB Mode)
Q2041	3SK73GR	MOS FET	TX 1st Mixer
Q2042	"	"	"
Q2043	2SC1815GR	Transistor	WIDTH Controller Select Relay (RL2001) Driver
Q2044	Not Used		
Q2045	2SA733AP	Transistor	TX PROC ON/OFF Switch (PROC ON)
Q2046	"	"	" (PROC OFF)
D2001	1SS53	Si Diode	T/R Switch (RX 1st IF ON)
D2002	1SS97	Schottky Barrier Di.	RX NB Gate
D2003	"	"	"
D2004	1SS53	Si Diode	RX 3rd IF Filter Switch (AM-W)
D2005	"	"	" (SSB, FSK, AM-N, CW)
D2006	"	"	" (CW-N)
D2007	"	"	" (AM-W)
D2008	"	"	" (SSB, FSK, AM-N, CW)
D2009	"	"	" (CW-N)
D2010	"	"	Filter Selector (SSB)
D2011	"	"	" (CW-W)
D2012	"	"	" (AM-N)
D2013	1SV55	Varactor Diode	RX NOTCH Filter Rejection Frequency Controller
D2014	1SS16	Schottky Barrier Di.	Threshold Level Compensator (for AM Detector)
D2015	1N60	Ge Diode	RX AM Detector
D2016	"	"	RX 3rd IF AGC Detector
D2017	"	"	"
D2018	1N270	"	RX RF AGC Detector
D2019	"	"	"
D2020	1SS53	Si Diode	Reverse Voltage Protector (for Q2015)
D2021	1N60	Ge Diode	RX FM Discriminator
D2022	"	"	"
D2023	"	"	RX FM Noise Detector
D2024	1SS53	Si Diode	Threshold Level Compensator (for RX FM Noise Detector)
D2025	1S188FM	Ge Diode	RX FM Noise Detector
D2026	1SS53	Si Diode	Reverse Voltage Protector (for Q2023)
D2027	1N60	Ge Diode	RX NB Detector
D2028	"	"	"

D2029	1S1555	Si Diode	RX NB Switch
D2030	1SV50	Varactor Diode	RX WIDTH VCXO
D2031	1N60	Ge Diode	TX AMGC Detector
D2032	"	"	"
D2033	1SS53	Si Diode	Switch (RX 9V for AMGC)
D2034	1N60	Ge Diode	TX COMP Meter Detector
D2035	"	"	"
D2036	1SS53	Si Diode	Logarithmic Compensator (for COMP Meter)
D2037	"	"	PROC Switch (PROC ON)
D2038	"	"	" (PROC OFF)
D2039	"	"	" ( " )
D2040	"	"	" (PROC ON)
D2041	"	"	T/R Switch (RX 3rd IF ON)
D2042	"	"	Filter Selector (CW-W)
D2043	"	"	" (CW-N)
D2044	"	"	" (AM-W)
D2045	"	"	" (AM-N)
D2046	1SS97	Schottky Barrier Di.	RX 2nd Filter Switch (AM)
D2047	"	"	" (SSB, FSK, CW)
D2048	"	"	" (CW-W)
D2049	"	"	" (AM)
D2050	"	"	" (SSB, FSK, CW)
D2051	"	"	" (CW-W)
D2052	1SS53	Si Diode	T/R Switch (RX 2nd IF ON)
D2053	"	"	TX 1st IF Filter Switch (SSB)
D2054	"	"	" ( " )
D2055	"	"	" ( " )
D2056	"	"	T/R Switch (TX 2nd IF ON)
D2057	"	"	" (TX ON for CW, AM, FM)
D2058	"	"	" ( " " " )
D2059	"	"	Reverse Voltage Protector (for Q2043)
D2060	FC63	Varactor Diode	RX NB Gate
D2061	1SS53	Si Diode	Diode OR (RX 9V for FM)
D2062	"	"	Threshold Level Compensator (for TX COMP Meter DC
D2063	"	"	Filter Selector (SSB) Amplifier Q1038)
D2064	"	"	" (CW-N)
D2065	"	"	RX FM 3rd Mixer (Q2016) Disable Switch (SSB, FSK, CW, AM
D2066	1N270	Ge Diode	RX RF AGC Detector
D2067	1SS53	Si Diode	Diode OR (FM 9V for FM)
D2068	Not Used		
D2069	"		
D2070	HZ7A2	Zener Diode	Regulator (TX 1st IF Switching Stabilizer)
D2071	1SS53	Si Diode	Reverse Voltage Protector (for Q2046)
X2001	8532.5kHz	Crystal (HC-18/U)	RX WIDTH VCXO
TH2001	SDT-250	Thermistor	Temperature Compensator (for RX FM SQL Switch)
XF2001	8.9M20A	Crystal Filter	RX 2nd IF Filter
XF2002	XF-455.8MCN	"	RX 3rd IF Filter (CW-N; OPTION)
XF2003	XF-8.9LP	"	TX SSB Filter
XF2004	XF-8.9GA	"	RX 2nd IF Filter (AM; OPTION)
XF2005	XF-8.9HSM	"	RX 2nd (TX 1st) IF Filter (SSB, FSK, CW)
XF2006	XF-8.9HC	"	RX 2nd IF Filter (CW-W; OPTION)

CF2001	CFM-455H	Ceramic Filter	RX 3rd IF Filter (AM-W)
CF2002	CFM-455J1	"	" (SSB, CW, FSK, AM-N)
CF2003	CFW-455E	"	" (FM)
CF2004	LFB-15	"	" ( " )

CD2001	SFD-455S4	Ceramic Filter	RX FM Discriminator
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## AF UNIT

Part No.	Device	Type	Function
Q3001	2SC732GR	Transistor	TX MIC Amplifier
Q3002	2SC945AP	"	" (FM)
Q3003	"	"	" ( " )
Q3004	"	"	" ( " )
Q3005	"	"	TX FM Carrier VCXO
Q3006	"	"	TX FM IF Amplifier
Q3007	"	"	TX MIC Amplifier (SSB, AM)
Q3008	"	"	" (SSB, AM, FSK)
Q3009	MC1496P	IC	TX Balanced Modulator (SSB, CW, AM, FSK)
Q3010	2SK107-3	JFET	TX AM ALC Amplifier
Q3011	2SC945AP	Transistor	TX VOX Amplifier
Q3012	"	"	"
Q3013	2SC1815GR	"	TX VOX Compensator
Q3014	"	"	"
Q3015	2SC945AP	"	TX AMGC Amplifier
Q3016	"	"	TX ANTI-TRIP Amplifier
Q3017	2SC1815GR	"	"
Q3018	2SA564AR	"	TX ANTI-TRIP Switch
Q3019	MC14011B	IC	TX VOX Gate
Q3020	2SC1815GR	Transistor	TX VOX Switch
Q3021	3SK73GR	MOS FET	RX Carrier Premixer
Q3022	2SC1815Y	Transistor	RX Carrier Buffer Amplifier
Q3023	MC14066B	IC	AF Mode Switch
Q3024	2SC945AP	Transistor	RX AF Preamplifier
Q3025	"	"	RX AF Active LPF
Q3026	AN6551	IC	RX AF APF, CW Sidetone Filter
Q3027	2SC945AP	Transistor	RX AF Buffer Amplifier (for AF OUT)
Q3028	μPC2002V	IC	RX Audio Amplifier
Q3029	μPC78L05	"	Regulator (FSK Circuit)
Q3030	Not Used		
Q3031	2SA733AP	Transistor	MODE Switch (SSB)
Q3032	2SA950Y	"	" (CW)
Q3033	2SA733AP	"	" (AM)
Q3034	"	"	" (FSK)
Q3035	2SA950Y	"	" (FM)
Q3036	2SB774	"	" (TX FM)
Q3037	NJM78L09A	IC	Regulator (TX FM Carrier VCXO)
Q3038	ND487R1-3R	IC (Ring Module)	RX Balanced Demodulator
D3001	1SS53	Si Diode	TX MIC Amplifier (Q3001) Disable Switch (FSK)
D3002	1S188FM	Ge Diode	TX FM IDC
D3003	"	"	"
D3004	FC53M-5	Varactor Diode	TX FM Modulator
D3005	MV103	Varistor Diode	Temperature Compensator [TX FM Modulator (D3005) Bias]
D3006	1SS53	Si Diode	TX FM Limiter
D3007	"	"	"

D3008	1SS53	Si Diode	MODE Switch (AM, CW TX IF OUT)
D3009	"	"	" (TX FM IF)
D3010	"	"	T/R Switch (TX CW, AM, FM IF OUT)
D3011	"	"	" ( " " " )
D3012	"	"	TX MIC Amplifier (Q3007) Disable Switch (CW, FM)
D3013	"	"	TX MIC Amplifier (Q3008) Disable Switch (CW, FM)
D3014	"	"	MODE Switch (SSB, FSK TX IF OUT)
D3015	"	"	" (TX Bal Mod out for CW, AM)
D3016	"	"	Diode OR (TX Bal Mod out CW)
D3017	"	"	" ( " " " " AM)
D3018	"	"	TX Balanced Modulator (Q3009) Carrier Balance Control Switch (AM)
D3019	"	"	TX Balanced Modulator (Q3009) Carrier Balance Control Switch (CW)
D3020	"	"	Diode OR (MIC Amplifier Disable on CW)
D3021	"	"	" ( " " " " FM)
D3022	"	"	TX AM ALC Impedance Isolator
D3023	"	"	TX VOX Amplifier (Q3011) Disable Switch (CW)
D3024	"	"	TX ANTI-TRIP Amplifier (Q3016) Disable Switch (CW)
D3025	1N270	Ge Diode	TX ANTI-TRIP Clamp
D3026	1SS53	Si Diode	TX ANTI-TRIP Control Switch (FSK)
D3027	"	"	" (FM)
D3028	HZ5C1	Zener Diode	Regulator [for TX FM Modulator (D3004) Bias]
D3029	1N270	Ge Diode	TX VOX Clamp
D3030	1SS53	Si Diode	RX Carrier Premixer (Q3021) Disable Switch (AM)
D3031	HZ5C1	Zener Diode	TX VOX AMP Clipper
D3032	1SS53	Si Diode	RX Carrier Premixer (Q3021) Disable Switch (FM)
D3033	Not Used		
D3034	"		
D3035	1SS53	Si Diode	TX BFO Switch (Input to Q3009)
D3036	"	"	Diode OR (CW, FSK +9V Line, from CW 9V)
D3037	"	"	" ( " " , from TX FSK 9V)
D3038	Not Used		
D3039	1SS53	Si Diode	Diode OR (TX FSK IF OUT)
D3040	"	"	" (TX SSB IF OUT)
D3041	"	"	" (FSK for SSB, CW, FSK 9V MODE Line)
D3042	"	"	" (CW " " " " )
D3043	"	"	" (SSB " " " " )
D3044	RD7.5EB1	Zener Diode	Regulator (FM TX 9V)
D3045	1SS53	Si Diode	Diode OR (FSK for FM 9V)
D3046	"	"	" (AM " " )
X3001	8.9875MHz	Crystal (HC-18/T3P)	TX FM Carrier VCXO

## PLL UNIT

Part No.	Device	Type	Function
Q4001	MPS-A13	Transistor	PLL BFO Active LPF
Q4002	2SK19TM-GR	Junction FET	PLL BFO VCO
Q4003	2SC535A	Transistor	PLL BFO Buffer Amplifier
Q4004	NJM78L09A	IC	Regulator (PLL +9V Line)
Q4005	2SC535A	Transistor	PLL BFO Buffer Amplifier
Q4006	HD10551	IC	PLL BFO 1/10 Divider
Q4007	2SC535A	Transistor	PLL BFO Buffer Amplifier
Q4008	2SC1815GR	"	PLL Data Switch (for PLL BFO, P. DIV, $\phi$ DET)
Q4009	3SK73GR	MOS FET	PLL BFO Buffer Amplifier
Q4010	$\mu$ PC7805H	IC	Regulator (PLL +5V Line)
Q4011	MB8718	"	PLL BFO, P. DIV, $\phi$ DET



Q4012	2SC380TM-Y	Transistor	PLL BFO IF Amplifier
Q4013	SN76514N	IC	PLL BFO Mixer
Q4014	MB8718	"	PLL (RX 1st, TX 2nd Local) P. DIV, $\phi$ DET
Q4015	MC14518B	"	PLL Reference 1/2, 1/10, 1/100 Divider
Q4016	MC14027B	"	RX Marker Switch, 1/2 Divider
Q4017	2SC380TM-Y	Transistor	RX Marker Buffer Amplifier
Q4018	SN74LS90N	IC	PLL Reference 1/10 Divider
Q4019	"	"	PLL Reference 1/3 Divider
Q4020	"	"	PLL Reference 1/10 Divider
Q4021	2SC380TM-Y	Transistor	PLL (RX 1st, TX 2nd Local) IF Buffer Amplifier
Q4022	HD10551	IC	PLL (RX 1st, TX 2nd Local) 1/10 Divider
Q4023	2SC380TM-Y	Transistor	PLL Reference 50 kHz Buffer Amplifier
Q4024	2SC1923R	"	PLL (RX 1st, TX 2nd Local) IF Amplifier
Q4025	2SC535C	"	PLL Reference 30 MHz Amplifier
Q4026	2SC380TM-Y	"	RX 2nd, TX 1st Local Oscillator
Q4027	"	"	RX 2nd, TX 1st Local Buffer Amplifier
Q4028	SN76514N	IC	PLL (RX 2nd, TX 1st Local) Mixer
Q4029	2SC1923R	Transistor	PLL (RX 2nd, TX 1st Local) IF Amplifier
Q4030	SN76514N	IC	PLL (RX 1st, TX 2nd Local) Mixer
Q4031	2SC1815GR	Transistor	PLL Unlock Switch
D4001	1SV55	Varactor Diode	PLL BFO VCO
D4002	1N60	Ge Diode	Clamp
D4003	1SS53	Si Diode	TX BFO Switch
X4001	38.0675MHz	Crystal (HC-18/U)	RX 2nd, TX 1st Local Oscillator
TH4001	31D26	Thermistor	Temperature Compensator (PLL BFO VCO)

## VCO UNIT

Part No.	Device	Type	Function
Q5001	NJM78L09A	IC	Regulator (for VCO Circuit)
Q5002	2SA733AP	Transistor	RX 1st, TX 2nd Local VCO (Q5003) Switch
Q5003	2SK19TM-BL	JFET	RX 1st, TX 2nd Local VCO (47.055–49.055 MHz)
Q5004	"	"	" (49.055–52.055 MHz)
Q5005	2SA733AP	Transistor	RX 1st, TX 2nd Local VCO (Q5004) Switch
Q5006	"	"	RX 1st, TX 2nd Local VCO (Q5007) Switch
Q5007	2SK19TM-BL	JFET	RX 1st, TX 2nd Local VCO (52.055–55.055 MHz)
Q5008	"	"	" (55.055–58.055 MHz)
Q5009	2SA733AP	Transistor	RX 1st, TX 2nd Local VCO (Q5008) Switch
Q5010	"	"	RX 1st, TX 2nd Local VCO (Q5011) Switch
Q5011	2SK19TM-BL	JFET	RX 1st, TX 2nd Local VCO (58.055–61.055 MHz)
Q5012	"	"	" (61.055–64.055 MHz)
Q5013	2SA733AP	Transistor	RX 1st, TX 2nd Local VCO (Q5012) Switch
Q5014	"	"	RX 1st, TX 2nd Local VCO (Q5015) Switch
Q5015	2SK19TM-BL	JFET	RX 1st, TX 2nd Local VCO (64.055–67.055 MHz)
Q5016	"	"	" (67.055–70.055 MHz)
Q5017	2SA733AP	Transistor	RX 1st, TX 2nd Local VCO (Q5016) Switch
Q5018	"	"	RX 1st, TX 2nd Local VCO (Q5019) Switch
Q5019	2SK19TM-BL	JFET	RX 1st, TX 2nd Local VCO (70.055–73.055 MHz)
Q5020	"	"	" (73.055–77.055 MHz)
Q5021	2SA733AP	Transistor	RX 1st, TX 2nd Local VCO (Q5020) Switch
Q5022	3SK73GR	MOS FET	RX 1st, TX 2nd Local Buffer Amplifier
Q5023	"	"	"
Q5024	2SC1815GR	Transistor	RX 1st Local Disable Switch (GEN 26–30 MHz)
Q5025	SN74LS145N	IC	Decoder (for RX 1st, TX 2nd Local VCO Selector)

D5001	1SV55	Varactor Diode	RX 1st, TX 2nd Local VCO	(47.055–49.055 MHz)
D5002	1SS53	Si Diode	RX 1st, TX 2nd Local VCO	(Q5003) Switch
D5003	"	"	RX 1st, TX 2nd Local VCO	(Q5004) Switch
D5004	1SV55	Varactor Diode	RX 1st, TX 2nd Local VCO	(49.055–52.055 MHz)
D5005	"	"	"	(52.055–55.055 MHz)
D5006	1SS53	Si Diode	RX 1st, TX 2nd Local VCO	(Q5007) Switch
D5007	"	"	RX 1st, TX 2nd Local VCO	(Q5008) Switch
D5008	1SV55	Varactor Diode	RX 1st, TX 2nd Local VCO	(55.055–58.055 MHz)
D5009	"	"	"	(58.055–61.055 MHz)
D5010	1SS53	Si Diode	RX 1st, TX 2nd Local VCO	(Q5011) Switch
D5011	"	"	RX 1st, TX 2nd Local VCO	(Q5012) Switch
D5012	1SV55	Varactor Diode	RX 1st, TX 2nd Local VCO	(61.055–64.055 MHz)
D5013	"	"	"	(64.055–67.055 MHz)
D5014	1SS53	Si Diode	RX 1st, TX 2nd Local VCO	(Q5015) Switch
D5015	"	"	RX 1st, TX 2nd Local VCO	(Q5016) Switch
D5016	1SV55	Varactor Diode	RX 1st, TX 2nd Local VCO	(67.055–70.055 MHz)
D5017	"	"	"	(70.055–73.055 MHz)
D5018	1SS53	Si Diode	RX 1st, TX 2nd Local VCO	(Q5019) Switch
D5019	"	"	RX 1st, TX 2nd Local VCO	(Q5020) Switch
D5020	1SV55	Varactor Diode	RX 1st, TX 2nd Local VCO	(73.055–77.055 MHz)
TH5001	D22A	Thermistor	Temperature Compensator (RX 1st, TX 2nd Local VCO)	

## CPU UNIT

Part No.	Device	Type	Function
Q6001	2SC1815Y	Transistor	Buffer
Q6002	2SA733AP	"	RESET Switch
Q6003	MC14093B	IC	NAND Gate (CPU RESET Timing)
Q6004	SN74LS14	"	Inverter
Q6005	MSM80C85ARS	"	CPU
Q6006	SN74LS75	"	Latch (PLL Output Data)
Q6007	SN74LS190	"	Up/Down Counter (Frequency Control)
Q6008	SN74LS02	"	NOR Gate
Q6009	MC14016	"	Analog Switch (Frequency Control Data Input)
Q6010	SN74LS74	"	Flip-flop (CK INH, ST OUT)
Q6011	SN74LS373	"	Latch (Address Data)
Q6012	SN74LS42	"	Decoder ( " )
Q6013	SN74LS02	"	NOR Gate
Q6014	"	"	"
Q6015	"	"	"
Q6016	μPD2364C-0402	"	ROM
Q6017	μPD445LC-1	"	RAM
Q6018	Not Used		
Q6019	SN74LS365	IC	Bus Driver (TRS Input Data)
Q6020	"	"	" ( " )
Q6021	SN74LS373	"	Latch (TRS Data, FSK Shift Data)
Q6022	"	"	" (WIDTH Freq Data)
Q6023	"	"	" ( " )
Q6024	μPD8279C-5	"	Programmable Keypad, Display Controller (Key Input Data, Frequency Display DATA)
Q6025	SN74LS145	"	Decoder (Key Scan Line)
Q6026	μPD8255AC5	"	Programmable I/O Port (IF SHIFT/BAND/MODE Data)
Q6027	"	"	" (PLL Data, VCO Select Data)
Q6028	MC14504	"	Level Shifter (PLL Output Data)
Q6029	"	"	" ( " )

Q6030	2SA733AP	Transistor	Regulator (CPU Unit +5V Line)
Q6031	Not Used		
Q6032	$\mu$ PC78L05	IC	Regulator (CPU Unit +5V Line)
Q6033	SN74LS123	"	Multivibrator (Buzzer Switching)
Q6034	TBP18SA030N	"	ROM (AUX Band Data)
D6001	10D1	Si Diode	Switch (System Backup)
D6002	1S1555	"	" ( " )
D6003	WZ071	Zener Diode	RESET Switch
D6004	1SS106	Schottky Barrier Di.	PD Data Output Disable Diode OR
D6005	"	"	" " " " "
D6006	1S1555	Si Diode	$\overline{CS}$ Diode OR
D6007	"	"	" " "
D6008	"	"	$\overline{CE1}$ Diode OR
D6009	"	"	" " "
D6010	"	"	PD Data Output Disable Switch
D6011	"	"	Status Data Output Enable
D6012	"	"	RESET Switch
X6001	6 MHz	Crystal (HC-18/U)	CPU Clock

#### MEMORY CHECK DECODER UNIT

Part No.	Device	Type	Function
Q2801	SN74LS05	IC	Inverter
Q2802	"	"	"
Q2803	SN74LS74	"	Latch (M. CHECK Data)
Q2804	2SC1815Y	Transistor	M. CHECK Data Reset Switch
Q2805	$\mu$ PD445LC-1	IC	RAM
D2801	1SS97	Schottky Barrier Di.	A2 M CK Gate
D2802	"	"	A5 M CK Gate
D2803	"	"	A6 M CK Gate

#### VFO UNIT

Part No.	Device	Type	Function
Q7001	TC5081P	IC	PLL VCO-1 Phase Detector
Q7002	MPS-A13	Transistor	PLL VCO-1 Active LPF
Q7003	2SC535A	"	PLL VCO-1
Q7004	"	"	PLL VCO-1 Buffer Amplifier
Q7005	SN76514N	IC	PLL VCO-1 Mixer
Q7006	2SC535A	Transistor	PLL VCO-1 IF Amplifier
Q7007	TC9122A	IC	PLL VCO-1 Programmable Divider
Q7008	2SC535A	Transistor	PLL VCO-1 Buffer Amplifier
Q7009	HD10551P	IC	PLL VCO-1 1/10 Divider
Q7010	SN76514N	"	PLL Mixer
Q7011	2SC1815Y	Transistor	PLL IF Amplifier
Q7012	"	"	"
Q7013	SN74LS90	IC	PLL IF 1/10 Divider
Q7014	SN76514N	"	PLL Mixer
Q7015	2SC535A	Transistor	PLL IF Buffer Amplifier
Q7016	2SK19TM-GR	JFET	PLL VCO-2 Buffer Amplifier
Q7017	SN76514N	IC	PLL VCO-2 Mixer
Q7018	2SC535A	Transistor	PLL VCO-2 IF Amplifier
Q7019	TC9122A	IC	PLL VCO-2 Programmable Divider

Q7020	TC5081P	IC	PLL VCO-2 Phase Detector
Q7021	2SC1815Y	Transistor	PLL LOCK Lamp Switch
Q7022	MPS-A13	"	PLL VCO-2 Active LPF
Q7023	2SK19TM-GR	JFET	PLL VCO-2
Q7024	2SC535A	Transistor	PLL VCO-2 Buffer Amplifier
Q7025	HD10551	IC	PLL VCO-2 1/10 Divider
Q7026	2SD880Y	Transistor	Regulator (PLL Circuit)
Q7027	μPC7808	IC	" (PLL +8V Line)
Q7028	μPC7805	"	" (PLL +5V Line)
Q7029	2SC1815Y	Transistor	PLL Reference Oscillator
Q7030	"	"	PLL Reference Buffer Amplifier
Q7031	2SC535A	"	PLL Reference Tripler
Q7032	"	"	PLL Reference Buffer Amplifier
Q7033	"	"	PLL Reference Doubler
Q7034	2SC1815Y	"	PLL Reference Buffer Amplifier
Q7035	2SC535A	"	PLL VCO-2 IF Buffer Amplifier
Q7036	2SA733AP	"	PLL Reference 10 kHz Buffer Amplifier
D7001	1S2209	Varactor Diode	PLL VCO-1
D7002	1SV55	"	PLL VCO-2
D7003	WZ100	Zener Diode	Regulator (PLL Circuit)
X7001	30MHz	Crystal (HC-18/U)	PLL Reference Oscillator
TH7001	31D26	Thermistor	Temperature Compensator (PLL VCO-2)
TH7002	PTH507A01- BG330N020	Posistor	" (PLL Reference Oscillator)

## LPF UNIT

Part No.	Device	Type	Function
D9001	1SS97	Schottky Barrier Di.	TX AM ALC Detector
D9002	"	"	"
D9003	"	"	TX FWD Detector
D9004	"	"	TX REF Detector
D9005	"	"	TX ALC Detector
D9006	"	"	TX REV ALC Detector
D9007	"	"	TX ALC Detector
D9008	"	"	TX REV ALC Detector
D9009	1S1555	Si Diode	Back Pulse Cancellor [for 12m, 10m LPF Relay (RL9013, 9014)]
D9010	"	"	Back Pulse Cancellor [for 17m, 15m LPF Relay (RL9011, 9012)]
D9011	"	"	" [for 20m LPF Relay (RL9009, 9010)]
D9012	"	"	" [for 30m LPF Relay (RL9007, 9008)]
D9013	"	"	" [for 40m LPF Relay (RL9005, 9006)]
D9014	"	"	" [for 80m LPF Relay (RL9003, 9004)]
D9015	"	"	" [for 160m LPF Relay (RL9001, 9002)]
D9016	"	"	" [for ANT Relay (RL9015)]

## DIAL UNIT

Part No.	Device	Type	Function
Q1301	MC14093B	IC	NAND Schmitt Trigger



Q1302	MC14012B	IC	Dual 4-Input NAND Gate
Q1303	MC14001B	"	NOR Gate
Q1304	MC14584B	"	Schmitt Trigger
Q1305	MC14011B	"	NAND Gate Multivibrator
Q1306	MC14013B	"	"D" Type Flip-Flop
Q1307	SN74LS00	"	NAND Gate
Q1308	MC14016B	"	Analog Switch
D1301	1S1555	Si Diode	Diode OR
D1302	"	"	"
D1303	"	"	"
D1304	"	"	"
D1305	"	"	Trigger
D1306	"	"	"
D1307	"	"	Diode OR
D1308	"	"	"
D1309	"	"	"
D1310	"	"	"

#### DISPLAY UNIT (A)

Part No.	Device	Type	Function
V1401	FIP-9E8A	FCD	Frequency Display
V1402	FIP-9P5	"	Sub Dial Display
D1401	TLY205	LED	ATT Indicator
D1402	"	"	M. CHECK Indicator
D1403	"	"	EXT Indicator
D1404	"	"	SPLIT Indicator
D1405	"	"	MR Indicator
D1406	"	"	VFO Indicator

#### DISPLAY UNIT (B)

Part No.	Device	Type	Function
Q1601	TC5067BP	IC	FCD Driver (for MODE Display)
Q1602	MSL912RS	"	" (for Segment)
Q1603	"	"	" (for Digit)
Q1604	"	"	" ( " )
Q1605	SN7445	"	Decoder (MODE Display Data)
Q1606	MC14514B	"	" (Display Data)
Q1607	NJM78L05A	"	Regulator (for Display Unit)
Q1608	2SC2002L	Transistor	DC-DC Converter OSC
Q1609	2SC1815GR	"	Blanking sw (for MODE Display)
D1601	1S1554	Si Diode	Diode Matrix (for MODE Display)
D1602	"	"	" ( " )
D1603	"	"	" ( " )
D1604	"	"	" ( " )
D1605	Not Used		
{	{		
D1612	Not Used		
D1613	1S1554	Si Diode	Diode Matrix (for MODE Display)
{	{	{	{
D1624	1S1554	Si Diode	Diode Matrix (for MODE Display)

D1625	Not Used		
D1632	Not Used		
D1633	1S1554	Si Diode	Rectifier (DC-DC Converter Vout)
D1634	1N270	Ge Diode	Timing (for MODE Display)

### DISPLAY UNIT (C)

Part No.	Device	Type	Function
Q2701	SN74LS75P	IC	Latch (MODE Data)
Q2702	SN74LS145N	"	Decoder ( " )
Q2703	2SA733AP	Transistor	Driver (for M. CHECK LED)
D2701	1S1554	Si Diode	Diode Matrix (for MODE Data)
D2716	1S1554	Si Diode	Diode Matrix (for MODE Data)

### KEY MATRIX UNIT

Part No.	Device	Type	Function
D1701	TLY205	LED	M. SHIFT Indicator
D1702	"	"	CLAR RX Indicator
D1703	"	"	CLAR TX Indicator
D1704	"	"	TAB Indicator
D1705	"	"	HAM Indicator
D1706	"	"	GEN Indicator
D1707	1SS53	Si Diode	Switch (for Keypad Switch)
D1727	1SS53	Si Diode	Switch (for Keypad Switch)

### FSK UNIT

Part No.	Device	Type	Function
Q1801	SN74LS00	IC	Oscillator (CW Sidetone Pitch, FSK Shift Frequency)
Q1802	TC9122P	"	Programmable Divider (for CW Sidetone Pitch, FSK Shift Frequency)
Q1803	MC14027B	"	1/4 Divider (for CW Sidetone Pitch, FSK Shift Frequency)
Q1804	SN74LS04	"	Inverter (for FSK Shift Frequency Selector)
Q1805	SN74LS09	"	AND Gate ( " )
Q1806	$\mu$ PC78L05	"	Regulator (for CW, FSK +5V Line)
Q1807	2SC1815GR	Transistor	Oscillator (Q1801) Controller
Q1808	"	"	KEY Switch
Q1809	"	"	"
Q1810	"	"	FSK Buffer Amplifier
Q1811	"	"	FSK Shift Frequency External Control Switch
Q1812	"	"	CW Break-in Switch
Q1813	"	"	CW Break-in Delay Controller
Q1814	"	"	CW Sidetone Buffer Amplifier

D1801	WZ034	Zener Diode	KEY Switch
D1802	1N270	Ge Diode	"
D1803	1SS53	Si Diode	Diode Matrix (for CW Sidetone Pitch, FSK Shift Frequency Selector)
}	}	}	}
D1825	1SS53	Si Diode	Diode Matrix (for CW Sidetone Pitch, FSK Shift Frequency Selector)
D1826	1N270	Ge Diode	Diode OR (for FSK Shift Frequency Controller)
}	}	}	}
D1832	1N270	Ge Diode	Diode OR (for FSK Shift Frequency Controller)
D1833	HZ5C2	Zener Diode	Regulator (CW +5V Line)
D1834	1SS53	Si Diode	CW Break-in Switch
D1835	1N270	Ge Diode	KEY Switch
X1801	6.8MHz	Crystal (HC-18/U)	Oscillator (for CW Sidetone Pitch, FSK Shift Frequency)

## REG UNIT

Part No.	Device	Type	Function
Q1901	MC14572	IC	Relay Timing Controller
Q1902	2SC1815GR	Transistor	T/R Switch (RX ON)
Q1903	2SA950Y	"	ANT Relay (RL9015) Driver
Q1904	2SA733AQ	"	CPU TX 9V Switch (TX ON)
Q1905	"	"	Relay Driver (for RL1902; TX ON)
Q1906	2SC945AQ	"	Regulator (+9V Line)
Q1907	"	"	" ( " )
Q1908	"	"	" ( " )
Q1909	2SC2002L	"	Oscillator (DC-DC Converter)
Q1910	2SC1815Y	"	Start up Current Limiter (+9V Bus)
Q1911	"	"	TX VOX Switch
Q1912	"	"	"
Q1913	2SA733AQ	"	Relay Driver (for RL1901)
Q1914	2SA950Y	"	RX 9V Switch (RX ON)
Q1915	"	"	RX 13.5V Switch (RX ON)
Q1916	2SC1815GR	"	T/R Switch (TX ON)
Q1917	2SA496Y	"	TX 9V Switch (TX ON)
Q1918	"	"	TX 13.5V Switch (TX ON)
Q1919	2SA733AQ	"	ANT Relay Driver (Q1903) Controller
Q1920	"	"	TX Monitor Switch Controller
D1901	1SS53	Si Diode	Diode OR (for TX Controller)
D1902	"	"	Back Pulse Canceller (for RL1901)
D1903	"	"	" (for RL1902)
D1904	"	"	Diode OR (for TX Controller)
D1905	Not Used		
D1906	WZ051	Zener Diode	Regulator (+9V Line)
D1907	1S1588	Si Diode	Rectifier (-9V Line)
D1908	HZ7A2	Zener Diode	Regulator ( " )
D1909	HZ11C1	"	" (DISP 10V and CPU TX 9V)
D1910	1SS53	Si Diode	Temperature Compensator for D1911
D1911	HZ3C1	Zener Diode	Start up Limiter Regulator
D1912	Not Used		
D1913	"		

D1914	1N270	Ge Diode	Delay Controller
D1915	HZ3C3	Zener Diode	Regulator (-9V Line)
D1916	1N270	Ge Diode	Switch (CW/TX 9V for Monitor)
D1917	WZ033	Zener Diode	TX Monitor Switch (Q1920) Bias Switch (CW)
D1918	1SS53	Si Diode	" " " CW Switch
D1919	1N270	Ge Diode	Monitor RX IF Disable Switch
D1920	"	"	"
D1921	1SS53	Si Diode	Reverse Voltage Protector for Q1901

#### SWITCH UNIT A

Part No.	Device	Type	Function
Q2301	2SC1815GR	Transistor	CW-CAL Switch
D2301	1SS53	Si Diode	VOX Control Switch (CW-CAL)

#### PHOTO-INTERRUPTER UNIT

Part No.	Device	Type	Function
RS2601	EE-SH3-X-1	Photo-Interrupter	Frequency Controller
RS2602	"	"	"

#### PROTECTOR UNIT

Part No.	Device	Type	Function
Q2901	AN6551	IC	Current Limiter
D2901	1S1555	Si Diode	External ALC Switch
D2902	"	"	"
D2903	"	"	ALC Switch

#### CONTROL UNIT

Part No.	Device	Type	Function
Q3501	AN6551	IC	Sensor Signal DC Amplifier
Q3502	2SC1815Y	Transistor	Fan Motor Driver (Q3503) Controller
Q3503	2SD592Q	"	Fan Motor Driver
Q3504	NJM78L08	IC	Regulator (CONTROL Unit +8V Line)
D3501	1S1555	Si Diode	Switch (for PS Unit Sensor Signal)
D3502	"	"	" (for PA Unit Sensor Signal)
D3503	"	"	Reverse Voltage Protector (for Q3503)

## MONITOR UNIT

Part No.	Device	Type	Function
Q3601	2SK107-3	JFET	RX AF Gate (RX ON)
Q3602	2SA733AP	Transistor	CW Gate Controller
Q3603	2SK107-3	JFET	TX Monitor Gate
Q3604	"	"	" Sidetone Gate
Q3605	"	"	AGC Gate
Q3606	2SC509Y	Transistor	Display Dim Controller
D3601	1SS106	Schottky Barrier Di.	RX AF Gate Switch
D3602	1SS53	Si Diode	Switch (CW 9V Line)
D3603	1SS106	Schottky Barrier Di.	AGC Gate Switch

## 100W PS UNIT

Part No.	Device	Type	Function
Q01	2N5685	Transistor	Regulator (+24V Line)
Q02	2SD717Y	"	" (+13.5V Line)
Q201	2SK147BL	JFET	" (+24V Line)
Q202	2SA1012Y	Transistor	" ( " )
Q203	2SA950Y	"	" ( " )
Q301	2SK19TM-GR	JFET	" (+13.5V Line)
Q302	2SA950Y	Transistor	" ( " )
Q303	2SA1015GR	"	" ( " )
D01	S25VB10	Si Diode Bridge	Rectifier (+24V Line)
D02	S5VB10	"	" (+13.5V Line)
D201	10D1	Si Diode	" (Sample Voltage)
D202	"	"	" ( " )
D203	HZ6C1	Zener Diode	Regulator (+24V Line)
D301	10D1	Si Diode	Rectifier (Sample Voltage)
D302	"	"	" ( " )
D303	HZ6C1	Zener Diode	Regulator (+13.5V Line)
TH01	112302-2	Thermistor	Fan Motor Control Sensor

## 100W PA UNIT

Part No.	Device	Type	Function
Q8001	2SC1589	Transistor	TX Driver Amplifier
Q8002	2SC2395	"	"
Q8003	"	"	"
Q8004	MRF422	"	TX Final Amplifier
Q8005	"	"	"
Q8006	μPC7808H	IC	Regulator (Final Amplifier Bias)
Q8007	2SD288K	Transistor	" ( " )

D8001	YZ033	Zener Diode	Regulator (Driver Amplifier Bias)
D8002	10D10	Si Diode	Temperature Compensator (Driver Amplifier Bias)
D8003	"	"	" ( " )
D8004	"	"	" (Final Amplifier Bias)
D8005	"	"	" ( " )
TH8001	32D27	Thermistor	Fan Motor Control Sensor

#### 10W PS UNIT

Part No.	Device	Type	Function
Q1501	μPC78L12	IC	Regulator (+13.5V Line)
Q1502	2SB529D	Transistor	" ( " )
Q1503	2SD745S	"	" ( " )
D1501	S5VB10	Si Diode Bridge	Rectifier (+13.5V Line)
D1502	10D1	Si Diode	" (Sample Voltage)
D1503	"	"	" ( " )
D1504	MV103	Varistor Diode	Temperature Compensator (+13.5V Line)

#### 10W PA UNIT

Part No.	Device	Type	Function
Q2801	2SC2166	Transistor	TX Driver Amplifier
Q2802	2SC2509	"	TX Final Amplifier
Q2803	"	"	"
Q2804	2SD882Q	"	Regulator (Final Amplifier Bias)
Q2805	μPC78L08	IC	" ( " )
D2801	YZ033	Zener Diode	Regulator (Driver Amplifier Bias)
D2802	MV11	Varistor Diode	Temperature Compensator (Final Amplifier Bias)