

## TECHNICAL DESCRIPTION

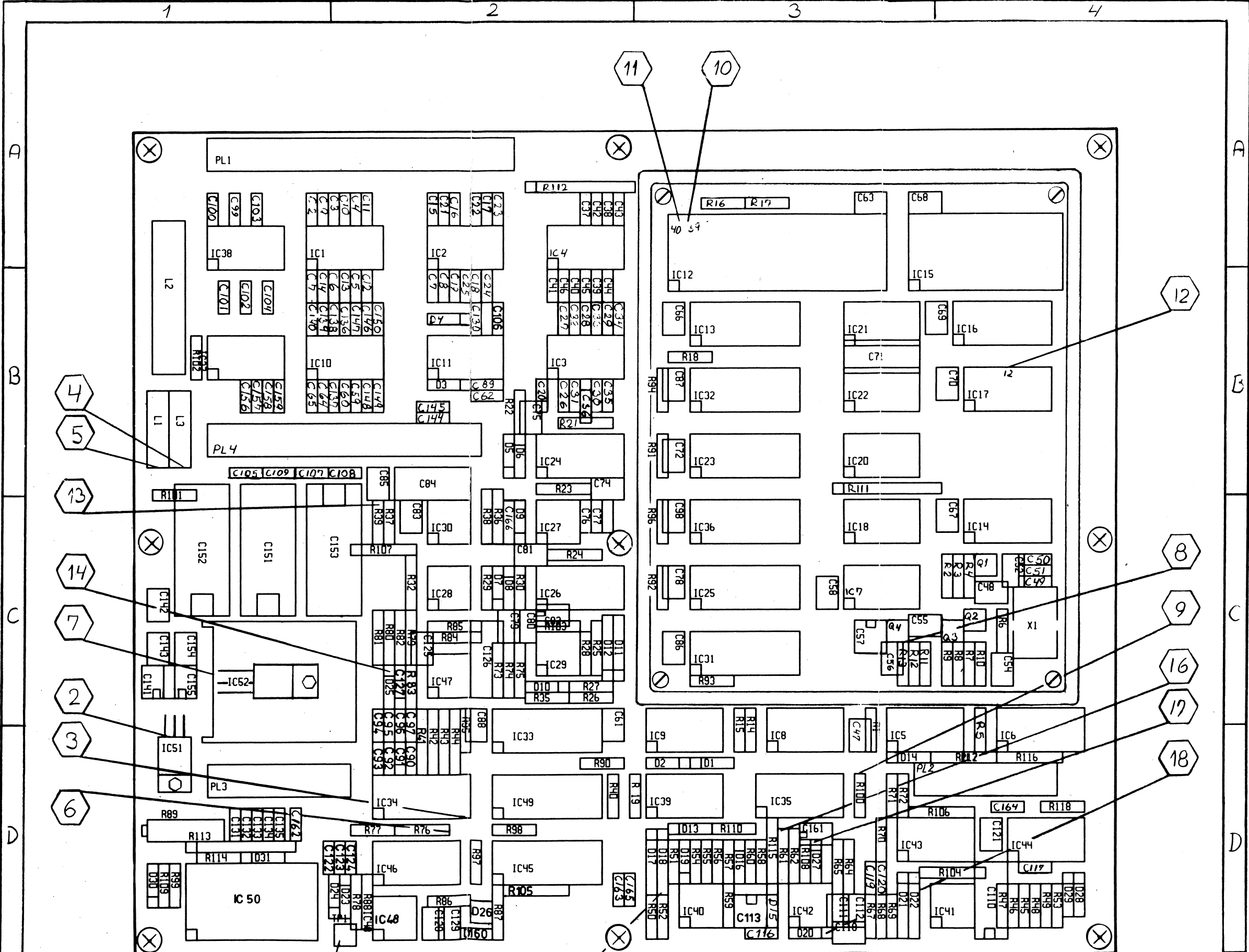
### PCB [624] TRANSCEIVER CONTROL BOARD

This module implements the following functions: Communication with Control Board [600] as a slave by receiving and executing command messages in order to control Receiver Signal Path [618], Exciter Signal Path [619], Synthesizer Board's [611] (one for the receiver and one for the exciter), P.A. Filters and Antenna Tuning Unit Board [660], and by transmitting acknowledge and status messages back to [600]. To achieve this, a structure similar to that described in the section concerning [600] is used: The "MPU" communicates with its counterpart on [600] using (TUDATA) and (CUDATA) via "RS 232C INTERFACE". Status of [618] (i.e. crystal filters installed) is read as a 16 bits packet using the signals (STAT DATA RX/EX), (CLOCK) and (STAT LOAD), while commands are transferred from [624] in the form of a 32 bits packet using (COMDATA), (CLOCK) and (COM LOAD RX/EX). This processor is also clocked by a "4 MHz XTAL OSCILLATOR" and is initialized by a "WATCHDOG" capable of automatically restarting a stalled program, which does not issue a 32 Hz trigger signal combined with "MODE SWITCH". "ADDRESS LATCH" and "MAP DECODER" operate in the same manner as on [600], "PROGRAM ROM" holds 16 kbytes in EPROM, while "SCAN BUFFER RAM" (1 knibbles) is used for holding the programmed scanning channels.

The frequency synthesizers on [611] are controlled via multiplexed data (SYNDATA 0--3) and address busses (SYNADR 0--2) using (SYNSTRO 0--5), whereas the corresponding switching between transceiving states on [618] and [619] is done by proper sequencing of the signals (TX/RX), (SHAPEKEY) and (MUTING) triggered by transitions of the signal (KEYLINE) originating from Audio Processing Board [601]. (KEYLINE) is also modulated by "VF CONVERTER" to carry a telemetry signal representing output power back to [600] via [601]. Two analog loops are located on this board. The most simple is associated with the receiving state of [618] through "MGC REGISTER" and the corresponding DAC driving "MGC LOOP" connected to another "VF CONVERTER" generating a new telemetry signal representing received signal strength (RXRATE). The other loop ("PA STRESS MONITOR/ALC LOOP") stabilizes the output in the transmitting state by comparing the output of the "SETPOINT REGISTER" and the corresponding DAC with the signals FILPEAK, PAPEAK and IANTAVR in order to generate the error signal ALC used for driving an electronically controlled attenuator placed in the transmitter signal path. If the signal (PA OK), derived from [654] Power Splitter, is high during transmission in full power, it means that one or more of the power amplifiers is faulty. In this (SET POINT) is decreased by 0.8 dB to prevent overload of the remaining power amplifiers.

Finally, another signal controlled from the processor is generated using "ALCHOLD REGISTER" and the corresponding DAC to make the gain of the transmitter signal path independent of the modulating signal. To increase the number of peripherals on this board beyond the capacity of "MAP DECODER" indirect addressing is introduced by using "SYNTHESIZER/MUXDATA REGISTER" not only for driving the synthesizers but also as a local bus feeding the following registers: "PA/LP REGISTER" (controls the relays switching the P.A. Filters depending on the TX frequency via "RELAY DRIVERS" and the power to Power Amplifier Board [626]), "MULTIPLEXER REGISTER" (controls a 16-to-1

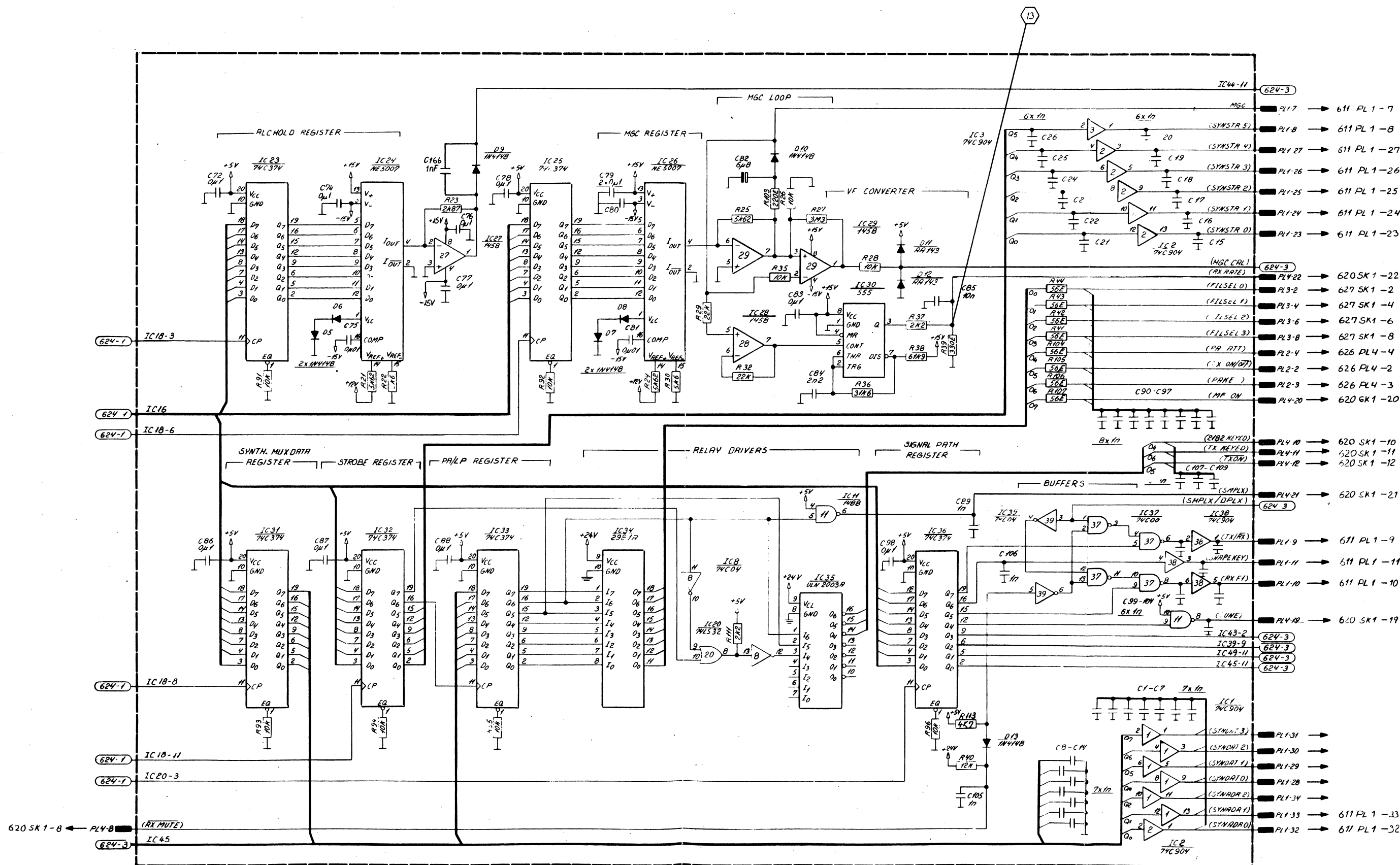
multiplexer "MUX" used for monitoring diagnostic and status signals) and "SETPOINT REGISTER" (already mentioned). Directly driven from the databus are "STROBE REGISTER" (strokes the synthesizer as described earlier) and "SIGNAL PATH REGISTER", which via "BUFFERS" controls the keying signals mentioned before. The handshake protocol with the processor located on 660 uses the signals (TUNE) and (TPR). The status of [660] is constantly monitored via (SWROK) and (TCO) and any changes detected are signalled to [600] using appropriately coded messages. In the same way [626] is monitored via (TC1) and "PA STRESS MONITOR/ALC LOOP". The signals (FILTYP 0--3) and (750/250) from P.A. Filters and [660] are used for identifying purposes by the "MPU".



PCB 624 VERSION 6A  
 TRANSCEIVER CONTROL BOARD  
 VIEWED FROM COMPONENT SIDE

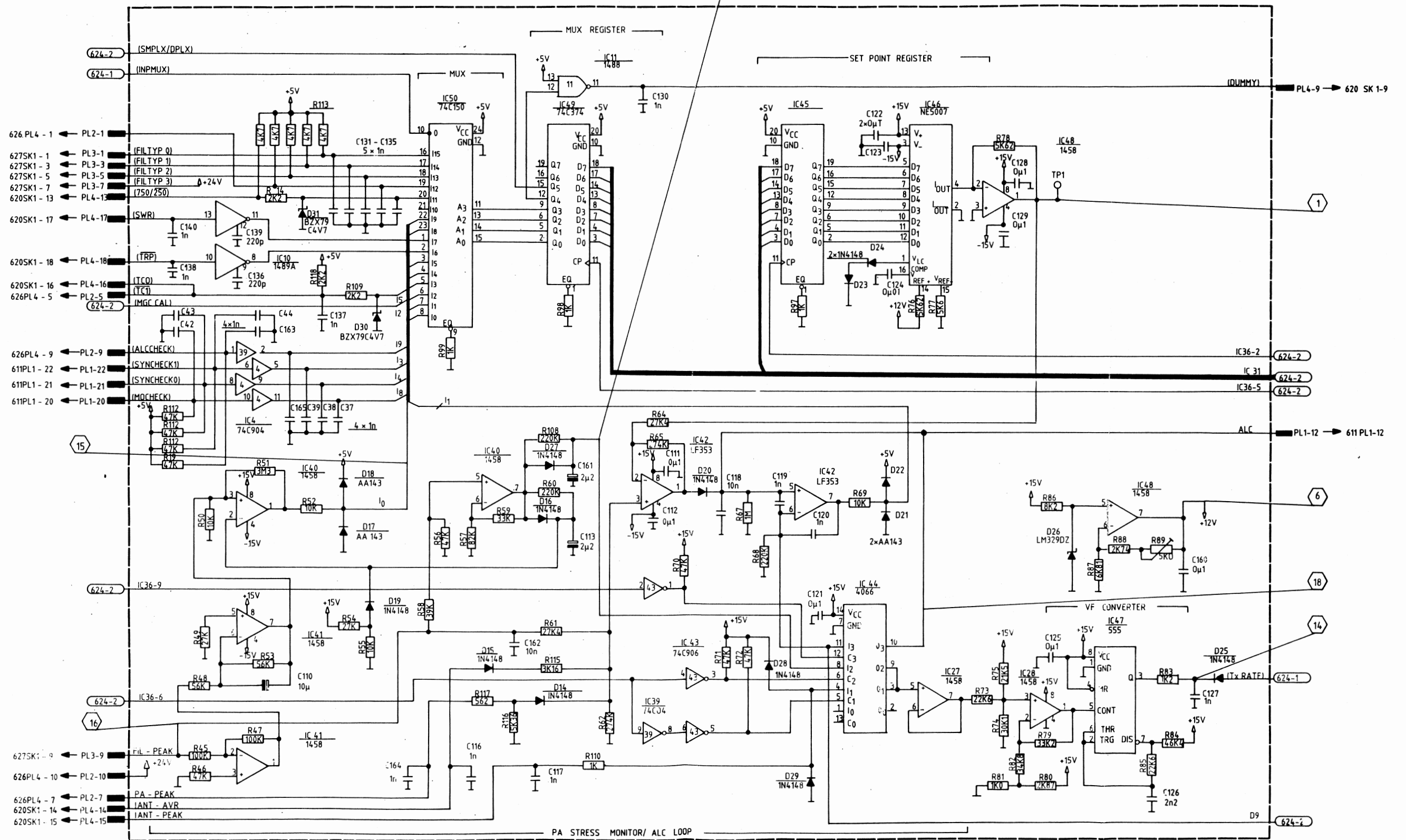






PCB 624 TRANSCEIVER CONTROL BOARD  
VERSION 6A. SUBDIAGRAM 2 OF 3





# TEST POINTS FOR 624 TU CONTROL BOARD

1 +8.62V (IN NORMAL CONDITION)

2 +5V


3 +24V


4 -15V


5 +15V


6 +12V


7 +5V


8 4Mhz +5V 0V 

9 32hz +5V 0V 

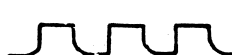
10 1Mhz +5V 0V 

11 1Mhz +5V 0V 

12 2400hz +5V 0V 

13 13.3Khz +2V 0V 

(NO SIGNAL RECEIVED)

14 10.5Khz +15V 0V 

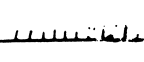
(NO KEYING)

15 NORMALLY 0V

IF IN A FULL POWER TRANSMISSION THE AVERAGE POWER EXCEEDS THE PEAK POWER MINUS 3dB IT CHANGES TO +5V THIS CAN BE TESTED BY WHISTLING IN THE MICROPHONE DURING TRANSMISSION.

16 9V dc WHEN 250W OUTPUT

17 6.5V dc WHEN 250W OUTPUT

18 3-6V dc +5V 0V  DEPENDING ON OUTPUT SIGNAL



## PARTS LIST FOR TRANSCEIVER CONTROL BOARD 624 VERSION 6A

## PARTS LIST FOR TRANSCEIVER CONTROL BOARD 624 VERSION 6A

Printed Circuit Board Complete 624 (specify program version when ordering)		107 562 41			10 kohm	5%	1/8W	MF	500 410 00
IC1-4, 38	74C904	857 490 40	R2-4, 26, 28, 35, 50, 52, 55, 69, 90-96	R5, 37, 109, 114	2.2 kohm	5%	1/8W	MF	500 322 00
IC5	CD4070BC	850 407 00		R7, 16, 17	3.3 kohm	5%	1/8W	MF	500 333 00
IC6	4020B	850 402 00		R8	6.8 kohm	5%	1/8W	MF	500 368 00
IC7	SN74LS93	850 749 32		R9, 18, 103	220 ohm	5%	1/8W	MF	500 222 00
IC8, 39	74C04	850 740 42		R10	100 ohm	5%	1/8W	MF	500 210 00
IC9, 44	CD4066BC	850 406 60		R11, 39	330 ohm	5%	1/8W	MF	500 233 00
IC10	1489P	850 148 90		R12	3.9 kohm	5%	1/8W	MF	500 339 00
IC11	1488P	850 148 80		R13	820 ohm	5%	1/8W	MF	500 282 00
IC12	6803	850 680 30		R14, 102	15 kohm	5%	1/8W	MF	500 415 00
IC13	74LS373	857 437 30		R15, 48, 53, 101	56 kohm	5%	1/8W	MF	500 456 00
IC14	74LS138	857 413 80		R19, 46, 56, 70-72, 100	47 kohm	5%	1/8W	MF	500 447 00
IC15	27128 (XX denotes program version number)	383 66X X1		R21, 24, 25, 76, 78	5.62 kohm	1%	1/4W	MF	511 356 20
				R22, 30, 77	5.6 kohm	5%	1/8W	MF	500 356 00
				R23, 80	2.87 kohm	1%	1/4W	MF	511 328 70
				R27, 51	3.3 Mohm	5%	1/4W	Car.	501 633 00
IC16	9124C	850 912 40		R29, 32	22 kohm	5%	1/8W	MF	500 422 00
IC17	CD4040BC	850 404 00		R36	31.6 kohm	1%	1/4W	MF	511 431 60
IC18, 20	74LS32	850 743 20		R38	61.9 kohm	1%	1/4W	MF	511 461 90
IC21	SN74LS20	850 740 21		R40	12 kohm	5%	1/8W	MF	500 412 00
IC22	74LS04	850 740 41		R41-44, 104-107	56 ohm	5%	1/2W	MF	512 156 00
IC23, 25, 31-33, 36, 45, 49	74C374	857 437 40		R45, 47	100 kohm	5%	1/8W	MF	500 510 00
				R49, 54	27 kohm	5%	1/8W	MF	500 427 00
				R58	39 kohm	5%	1/8W	MF	500 439 00
				R57	82 kohm	5%	1/8W	MF	500 482 00
IC24, 26, 46	NE5007	850 500 70		R59	33 kohm	5%	1/8W	MF	500 433 00
IC27-29, 40, 41, 48	MC1458N	850 145 80		R60, 68, 108	220 kohm	5%	1/8W	MF	500 522 00
IC30, 47	NE555	850 055 50		R61, 64	27.4 kohm	1%	1/4W	MF	511 427 40
IC34	UDN2981	850 298 10		R62, 65	274 kohm	1%	1/4W	MF	511 527 40
IC35	ULN2003A	850 200 30		R67	1 Mohm	5%	1/8W	MF	500 610 00
IC37	74C00	850 740 01		R73, 85	22.6 kohm	1%	1/4W	MF	511 422 60
IC42	LF353	850 035 30		R74	30.1 kohm	1%	1/4W	MF	511 430 10
IC43	74C906	857 490 60		R75	21.5 kohm	1%	1/4W	MF	511 421 50
IC50	74C150	857 415 00		R79	33.2 kohm	1%	1/4W	MF	511 433 20
IC51, 52	MA7805	850 780 50		R81	1.0 kohm	1%	1/4W	MF	511 310 00
Q1-4	BF240	840 024 00		R82	34.8 kohm	1%	1/4W	MF	511 434 80
D1-10, 13-16, 19, 20, 23-25, 27-29	1N4148	830 414 80		R83	1.2 kohm	5%	1/8W	MF	500 312 00
D26	LM329DZ	830 032 90		R84	46.4 kohm	1%	1/4W	MF	511 446 00
D11, 12, 17, 18, 21, 22 D30, 31	AA143 BZX79CAV7	830 014 30 832 794 70		R86	8.2 kohm	5%	1/8W	MF	500 382 00
X1	4MHz CRYSTAL	812 000 00		R87	6.81 kohm	1%	1/4W	MF	511 368 10
R1, 6, 110, 97-99	1 kohm 5% 1/8W MF	500 310 00		R88	2.74 kohm	1%	1/4W	MF	511 327 40
				R89	5 kohm			Pot.	582 310 02
				R111	2.2 kohm			Sil.	530 000 12
				R112	4.7 kohm			Sil.	530 000 11
				R113	4.7 kohm			Sil.	530 000 06
				R115	3.16 kohm	1%	1/4W	MF	511 331 60
				R116	5.36 kohm	1%	1/4W	MF	511 353 60
				R117	562 ohm	1%	1/4W	MF	511 256 20

# PARTS LIST FOR TRANSCEIVER CONTROL BOARD 624 VERSION 6A

C1-46, 60, 62, 65, 89, 90-97, 99-109, 116, 117, 119, 120, 127, 130-135, 137, 138, 140, 144-150, 156-159, 163, 164-166	1 nF	10%	100V	Cer.	603 310 02
C47, 52, 54, 55, 75, 81, 85, 118, 124	10 nF	10%	63V	Polyes.	622 410 01
C48, 56, 58, 61, 63, 66-70, 72, 74, 76-80, 83, 86-88, 98, 111, 112, 121-123, 125, 128, 129, 142, 160	0.1 uF	10%	63V	Polyes.	622 510 00
C49	39 pF	2%	63V	N150	602 139 01
C50	1.2 nF	10%	100V	Cer.	602 312 00
C51	180 pF	10%	63V	Cer.	602 218 00
C57, 82, 141, 155	6.8 uF	20%	25V	Sol.al.	652 668 01
C59, 64, 136, 139	220 pF	10%	100V	Cer.	603 222 00
C71, 84, 126	2.2 nF	1%	125V	Polyst.	613 322 00
C110	10 uF	+50-10%	16V	W.alum.	651 710 01
C113, 161	2.2 uF	20%	35V	Tantal	652 622 01
C143, 154	0.47 uF	10%	63V	Polyes.	622 547 01
C151-153	100 uF	20%	25V	W.alum.	652 810 00
C162	10 nF	-20+50%	100V	Cer.	602 410 01
L1, L3	22 uH				740 122 00
L2	100 uH				740 210 06
PL1	40 Pol.				756 040 04
PL2, 3	10 Pol.				756 010 02
PL4	34 Pol.				756 034 01