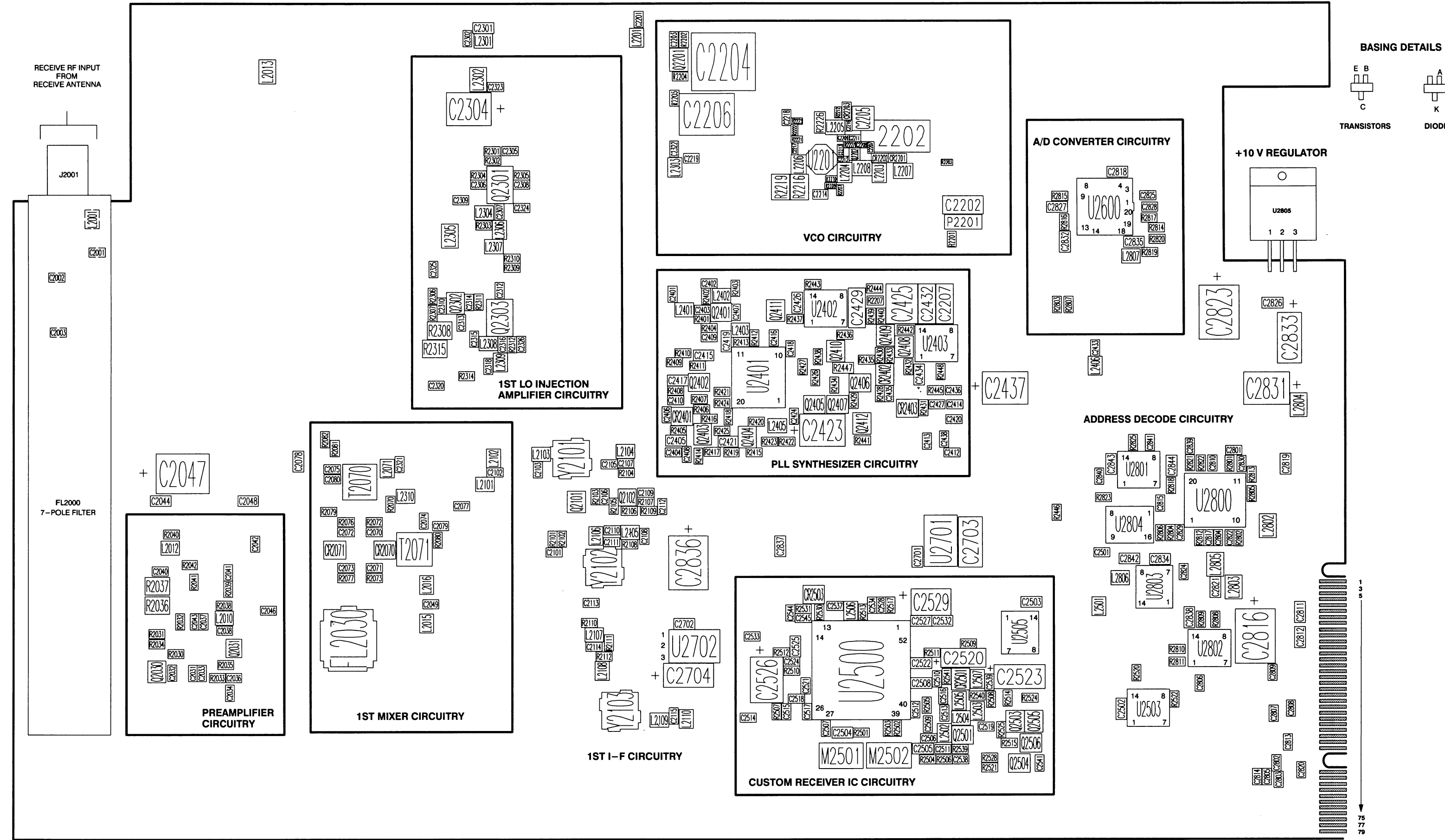
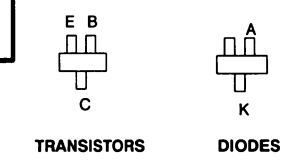


900 MHz RECEIVER MODULE
MODEL TRF6552H



BASING DETAILS



NOTE:

THE CIRCUIT BOARD EDGE CONNECTOR HAS PRINTED CIRCUIT PLATED CONTACTS ON BOTH SIDES OF THE BOARD EDGE. THE COMPONENT SIDE CONTACTS ARE NUMBERED 1, 3, 5, ETC. THE SOLDER SIDE CONTACTS ARE NUMBERED 2, 4, 6, ETC.

SEE THE FOLLOWING TABLE FOR EDGE CONNECTOR PIN NUMBERING/SIGNAL NAME CROSS-REFERENCE.

PIN	SIGNAL NAME	PIN	SIGNAL NAME
1	GND	2	GND
3	GND	4	GND
5	EXT_SPARE1	6	EXT_SPARE2
7	EXT_SPARE3	8	EXT_SPARE4
9	EXT_SPARE5	10	EXT_SPARE6
11	EXT_SPARE7	12	EXT_SPARE8
13	EXT_SPARE9	14	EXT_SPARE10
15	EXT_SPARE11	16	EXT_SPARE12
17	RX_WB_AUDIO	18	GND
19	GND	20	GND
21	GND	22	+14.2 V INPUT
23	+14.2 V INPUT	24	+14.2 V INPUT
25	+14.2 V INPUT	26	+14.2 V INPUT
27	+5 V INPUT	28	+5 V INPUT
29	+5 V INPUT	30	+5 V INPUT
31	+5 V INPUT	32	+5 V INPUT
33	+5 V INPUT	34	+5 V INPUT
35	GND	36	GND
37	SPI_MISO	38	SPI_MOSI
39	SPI_CLK	40	RESET
41	HDLC_DATA	42	HDLC_BUSY
43	HDLC_CLK	44	TDM_SYNC
45	TDM_DATA	46	TDM_CLOCK
47	SPARE 1	48	SPARE 2
49	SPARE 3	50	SPARE 4
51	SPARE 5	52	SPARE 6
53	A0_CS1	54	A0_CS2
55	P5	56	A5
57	P4	58	A4
59	P3	60	A3
61	P2	62	A2
63	GND	64	GND
65	RX_2_1_REF	66	N/C
67	GND	68	GND
69	N/C	70	N/C
71	GND	72	GND
73	GND	74	AGC_IN
75	ODC	76	SBI
77	DATA	78	DATA*
79	GND	80	GND

900 MHz RECEIVER MODULE
MODEL TRF6552H

parts list

TRF6552H Receiver Module (900 MHz) PL-13079-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C2001	2113740G09	1.8 pF ±0.1 pF, 50 V
C2002	2113740G15	3.3 pF ±0.1 pF, 50 V
C2003	2113740G13	2.7 pF ±0.1 pF, 50 V
C2031,2032	2113741A45	0.01 uF ±5%, 50 V
C2033	2113740A43	39 pF ±5%, 50 V
C2034	2113740A35	18 pF ±5%, 50 V
C2036	2113740A19	4.7 pF ±0.25 pF, 50 V
C2037,2038	2113740A43	39 pF ±5%, 50 V
C2040	2113740A43	39 pF ±5%, 50 V
C2041	2113740A17	3.9 pF ±0.25 pF, 50 V
C2042	2113740G03	1 pF ±0.1 pF, 50 V
C2043	2113741A45	0.01 uF ±5%, 50 V
C2044	2113741B69	0.1 uF ±5%, 50 V
C2046	2113740G11	2.2 pF ±0.1 pF, 50 V
C2047	2380090M25	100 uF, 25 V
C2048	2113741B69	0.1 uF ±5%, 50 V
C2049	2113740G03	1 pF ±0.1 pF, 50 V
C2070 thru 2073	2113741A45	0.01 uF ±5%, 50 V
C2074	2113740A17	3.9 pF ±0.25 pF, 50 V
C2075	2113740A43	39 pF ±5%, 50 V
C2077	2113741A45	0.01 uF ±5%, 50 V
C2078	2113741B69	0.1 uF ±5%, 50 V
C2079	2113740A55	100 pF ±5%, 50 V
C2080	2113740G11	2.2 pF ±0.1 pF, 50 V
C2101	2113741A45	0.01 uF ±5%, 50 V
C2102	2113740A27	8.2 pF ±0.25 pF, 50 V
C2103	2113740A24	6.8 pF ±0.25 pF, 50 V
C2105	2113740A19	4.7 pF ±0.25 pF, 50 V
C2106	2113741A45	0.01 uF ±5%, 50 V
C2107	2113740G05	1.2 pF ±0.1 pF, 50 V
C2108,2109	2113741A45	0.01 uF ±5%, 50 V
C2110,2111	2113740A27	8.2 pF ±0.25 pF, 50 V
C2112	2113741A45	0.01 uF ±5%, 50 V
C2113	2113740G09	1.8 pF ±0.1 pF, 50 V
C2114	2113740G11	2.2 pF ±0.1 pF, 50 V
C2115	2113740G15	3.3 pF ±0.1 pF, 50 V
C2201	2113740A43	39 pF ±5%, 50 V
C2202	0811017A08	0.01 uF ±5%, 50 V
C2203	2113741A45	0.01 uF ±5%, 50 V
C2204	2380090M27	330 uF ±20%, 16 V
C2205	2113906B03	CAP CER CHIP CL1 LSR 2.5/3.5PF
C2206	2380090M36	CAP 100 uF 25V
C2207	2113742K26	CAP CER CHIP 2.7PF ± 0.1PF
C2208	2113742K38	CAP CER CHIP 4.7PF ± 0.1PF
C2209	2113742K42	CAP CER CHIP 5.6PF ± 0.1PF
C2211	2113742K44	CAP CER CHIP 8.8PF ± 0.1PF
C2212	2113740F07	1.5 pF ±0.1 pF, 50 V
C2214	2113741A53	0.022 uF ±5%, 50 V
C2217	2113740F43	47 pF ±5%, 50 V
C2219	2113740A43	39 pF ±5%, 50 V
C2301	2113741B69	0.1 uF ±5%, 50 V
C2302	2113740A43	39 pF ±5%, 50 V
C2304	2380090M24	10 uF ±20%, 50 V
C2305	2113740A17	3.9 pF ±0.25 pF, 50 V
C2306	2113740A79	1000 pF ±5%, 50 V
C2307	2113740A43	39 pF ±5%, 50 V
C2308	2113740A79	1000 pF ±5%, 50 V
C2309	2113740A43	39 pF ±5%, 50 V
C2310	2113741A45	0.01 uF ±5%, 50 V
C2312	2113740G13	2.7 pF ±0.1 pF, 50 V
C2313	2113740A43	39 pF ±5%, 50 V
C2314	2113741A45	0.01 uF ±5%, 50 V
C2315	2113740A79	1000 pF ±5%, 50 V
C2316	2113740A29	10 pF ±5%, 50 V
C2318	2113740G15	3.3 pF ±0.1 pF, 50 V
C2320	2113740G03	1 pF ±0.1 pF, 50 V

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C2321	2113740G11	2.2 pF ±0.1 pF, 50 V
C2322	2113740A19	4.7 pF ±0.25 pF, 50 V
C2323	2113740G15	2.2 pF ±0.1 pF, 50 V
C2324	2113740G09	1.8 pF ±0.1 pF, 50 V
C2325	2113741B69	2.2 pF ±0.1 pF, 50 V
C2326	2113740G09	1.8 pF ±0.1 pF, 50 V
C2401	2113740G13	2.7 pF ±0.1 pF, 50 V
C2402,2403	2113740A43	39 pF ±5%, 50 V
C2404	2113740A19	4.7 pF ±0.25 pF, 50 V
C2405	2113741B69	0.1 uF ±5%, 50 V
C2406 thru 2408	2113740A43	39 pF ±5%, 50 V
C2409	2113740A79	1000 pF ±5%, 50 V
C2410	2113740A71	470 pF ±5%, 50 V
C2412 thru 2414	2113740A43	39 pF ±5%, 50 V
C2415	2113741B69	0.1 uF ±5%, 50 V
C2416	2113740A43	39 pF ±5%, 50 V
C2417	2113741B69	0.1 uF ±5%, 50 V
C2418	2113740A43	39 pF ±5%, 50 V
C2419	2113741B69	0.1 uF ±5%, 50 V
C2420	2113741B69	39 pF ±5%, 50 V
C2421	2113740A43	0.1 uF ±5%, 50 V
C2423	2380090M24	10 uF ±20%, 50 V
C2424	2113740A43	39 pF ±5%, 50 V
C2425	0811051A18	0.68 uF ±5%, 63 V
C2426	2113741B69	0.1 uF ±5%, 50 V
C2427	2113740A43	39 pF ±5%, 50 V
C2429	0811051A11	0.047 uF ±5%, 63 V
C2432	0811017A08	0.01 uF ±5%, 50 V
C2433	2113740A43	39 pF ±5%, 50 V
C2434	2113741B69	0.1 uF ±5%, 50 V
C2435,2436	2113740A43	39 pF ±5%, 50 V
C2437	2380090M24	10 uF ±20%, 50 V
C2438	2113740A43	39 pF ±5%, 50 V
C2501	2113741A45	0.01 uF ±5%, 50 V
C2502 thru 2505	2113741B69	0.1 uF ±5%, 50 V
C2506	2113740A21	5.6 pF ±0.25 pF, 50 V
C2507	2113741A45	0.01 uF ±5%, 50 V
C2508	2113741B69	0.1 uF ±5%, 50 V
C2509	2113740A24	6.8 pF ±0.25 pF, 50 V
C2510	2113740G11	2.2 pF ±0.1 pF, 50 V
C2511	2113740A24	6.8 pF ±0.25 pF, 50 V
C2512	2113741A45	0.01 uF ±5%, 50 V
C2513	2113740A39	27 pF ±5%, 50 V
C2514,2515	2113741A45	0.01 uF ±5%, 50 V
C2516	2113740A42	36 pF ±5%, 50 V
C2517,2518	2113741A45	0.01 uF ±5%, 50 V
C2519	2113740A79	1000 pF ±5%, 50 V
C2520	2311049A10	2.2 uF ±10%, 35 V
C2521	2113741A61	0.047 uF ±5%, 50 V
C2522	2113741B69	0.1 uF ±5%, 50 V
C2523	2311049A21	22 uF ±10%, 20 V
C2524	2462587X59	0.033 uF ±5%, 50 V
C2525	2113741A57	0.1 uF ±5%, 50 V
C2526	2113741B69	0.1 uF ±5%, 50 V
C2527	2380090M24	10 uF ±20%, 50 V
C2528	2113741B69	0.1 uF ±5%, 50 V
C2529	2380090M22	4.007 uF ±20%, 50V
C2532	2113741B69	0.1 uF ±5%, 50 V
C2533,2534	2113741A45	0.01 uF ±5%, 50 V
C2537	2113740A71	470 pF ±5%, 50 V
C2538	2113740A39	27 pF ±5%, 50 V
C2539	2113740A79	1000 pF ±5%, 50 V
C2544	2113741A53	0.022 uF ±5%, 50 V
C2545	2113740A55	100 pF ±5%, 50 V
C2701,2702	2113741B69	0.1 uF ±5%, 50 V
C2703,2704	2113740A21	22 uF ±10%, 20 V
C2801,2802	2113740A33	15 pF ±5%, 50 V
C2803	2113740A71	470 pF ±5%, 50 V
C2804,2805	2113740A33	15 pF ±5%, 50 V
C2806 thru 2809	2113740A55	100 pF ±5%, 50 V
C2810	2113740A33	15 pF ±5%, 50 V

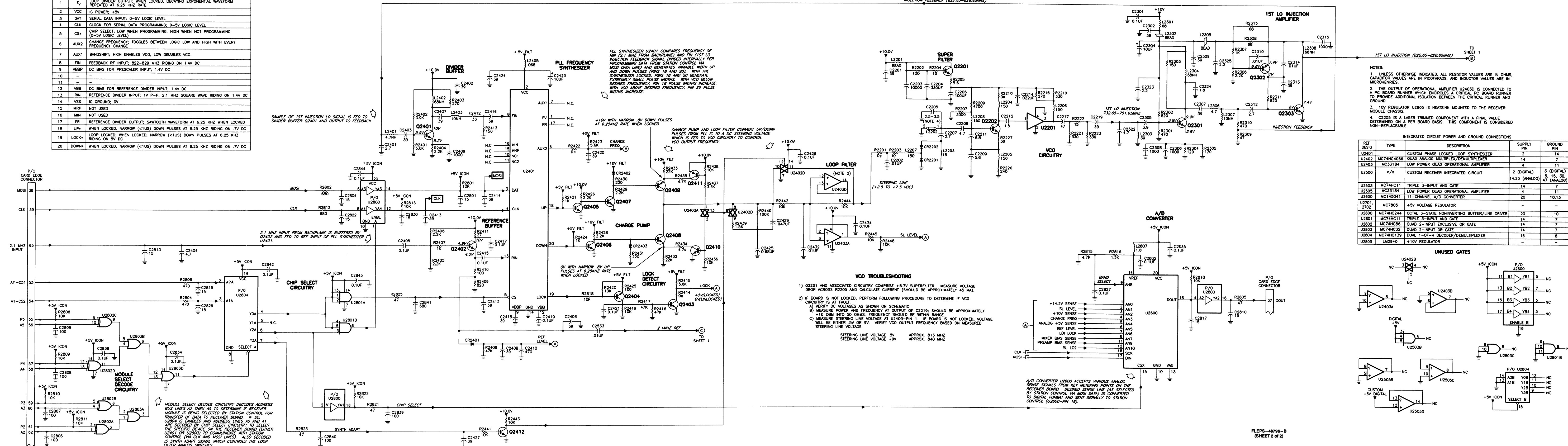
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C2811,2812	2113741B69	0.1 uF ±5%, 50 V
C2813 thru 2815	2113740A33	15 pF ±5%, 50 V
C2816	2380090M25	100 uF, 25 V
C2817	2113740A33	15 pF ±5%, 50 V
C2818,2819	2113741B69	0.1 uF ±5%, 50 V
C2820	2113740A45	100 pF ±5%, 50 V
C2821	2113741B69	0.1 uF ±5%, 50 V
C2822	2113740A33	15 pF ±5%, 50 V
C2823	2380090M25	100 uF, 25 V
C2824	2113741A45	0.01 uF ±5%, 50 V
C2825	2113740A71	470 pF ±5%, 50 V
C2826,2827	2113741B69	0.1 uF ±5%, 50 V
C2828	2113740A71	470 pF ±5%, 50 V
C2829,2830	2113740A33	15 pF ±5%, 50 V
C2831	2380090M24	10 uF ±20%, 50 V
C2832	2113741B69	0.1 uF ±5%, 50 V
C2833	2311049A21	22 uF ±10%, 20 V
C2834,2835	2113741B69	0.1 uF ±5%, 50 V
C2836	2380090M25	100 uF, 25 V
C2837,2838	2113741B69	0.1 uF ±5%, 50 V
C2839,2840	2113740A45	100 pF ±5%, 50 V
C2841	2113740A75	680 pF ±5%, 50 V
C2842 thru 2844	2113741B69	0.1 uF ±5%, 50 V
CR2070,2071	4882290T04	Diode, hot carrier
CR2201,2202	4862824C01	DIODE VARACTOR
CR2401	4813825A05	Hot Carrier
CR2402,2403	4813833C10	0.1A, 70 V
CR2501	4813825A01	3V, dual
CR2503	4813825A01	3V, dual
E2001	1585021U02	mechanical: Shield: 800 preselector
SH2202	2683380X01	SHIELD, VCO, 800
FL2000	9184682T02	filter: FILTER CERAMIC 900MHZ
FL2030	5105279V12	HYBRID 3 POLE STRIPLINE FILTER
M2501,2502	9185128U02	FLTR L-C 450KC LCF-450
J2001	0984393T01	connector: receptacle: UHF
L2001	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2010	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2012	2462587N71	1800 nH, ±5%
L2013	2484657R01	ferrite bead
L2015,2016	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L2071	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2101	2462587X55	IND CHIP LO-PRO 150 NH 5%
L2102	2462587X59	IND CHIP LO-PRO 330 NH 5%
L2103,2104	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2105	2462587N71	1800 nH, ±5%
L2106	2462587X64	IND CHIP LO-PRO 880 NH 5%
L2107,2108	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2109	2462587X59	IND CHIP LO-PRO 330 NH 5%
L2110	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2201	2484657R01	ferrite bead
L2202	9183223X02	RESONATOR COAX CERAMIC
L2203	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2204 thru 2208	2462587X55	IND CHIP LO-PRO 150 NH 5%
L2301	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2302	2484657R01	ferrite bead
L2303	2462587X48	IND CHIP LO-PRO 39.0 NH 5%
L2304	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2305	2484657R01	ferrite bead
L2306	2462587R16	4.7 nH, ±5%
L2307	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L2308	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2309,2310	2462587R17	Chip; inductor; 8.2 NH 5%
L2401	2462587R16	4.7 nH, ±5%

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L2402	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2403	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L2405,2406	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2501	2462587X57	CHIP RES 15 OHMS 5%
L2502	2419923A17	IND CHIP 820 NH 2%
L2503,2504	2462587N72	2200 NH, ±5%
L2505	2419923A05	IND CHIP 120 NH 2%
L2506	2462587N71	1800 nH, ±5%
L2507	2419923A07	IND CHIP 180 NH 2%
L2802 thru 2805	2484657R01	ferrite bead
L2806	2462587X51	IND CHIP LO-PRO 68.0 NH 5%
L2807	2462587N71	1800 nH, ±5%
Q2030	4813824A17	transistor (see note): PNP
Q2031	4813827A15	PNP
Q2101	4813824A10	NPN
Q2102	4885228U05	TSTR GAAS DL GATE MESFET_U7_
Q2201	4813824A10	NPN
Q2202	4885228U03	TSTR NPN 6V 30UA 12GHZ NE68519
Q2301	4813827A26	Transistor, NPN
Q2302	4813824A17	PNP
Q2303	4813827A26	Transistor, NPN
Q2401	4813827A03	NPN
Q2402,2403	4813824A10	NPN
Q2404	4813824A17	PNP
Q2405 thru 2408	4813824A10	NPN
Q2409	4813824A17	PNP
Q2410	4813824A10	NPN
Q2411	4813824A17	PNP
Q2412	4813824A10	NPN
Q2501	4813827A03	

900 MHz RECEIVER MODULE MODEL TRF6552H

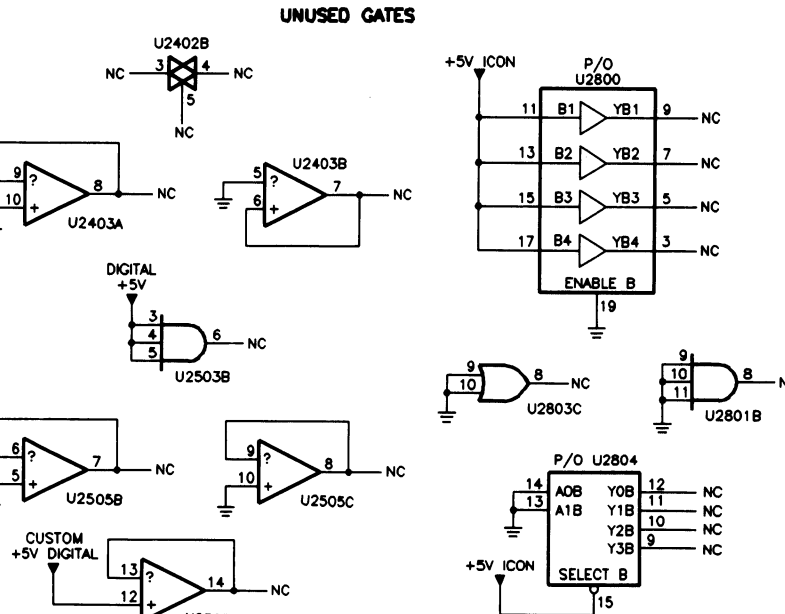
U2401 PINOUT INFORMATION

PIN #	SIGNAL NAME	DESCRIPTION/NOMINAL VOLTAGE
1	FV	LOOP DIVIDER OUTPUT; WHEN LOCKED, DECAYING EXPONENTIAL WAVEFORM REPEATED AT 6.25 KHZ RATE.
2	VCC	IC POWER; +5V
3	DAT	SERIAL DATA INPUT; 0-5V LOGIC LEVEL
4	CLK	CLOCK FOR SERIAL DATA PROGRAMMING; 0-5V LOGIC LEVEL
5	CS*	CHIP SELECT; LOW WHEN PROGRAMMING, HIGH WHEN NOT PROGRAMMING (0-5V LOGIC LEVEL)
6	AUX2	CHANGE FREQUENCY; TOGGLES BETWEEN LOGIC LOW AND HIGH WITH EVERY FREQUENCY CHANGE
7	AUX1	BANDSHIFT; HIGH ENABLES VCO, LOW DISABLES VCO.
8	FIN	FEEDBACK RF INPUT; 822-829 MHz RIDING ON 1.4V DC
9	VBBP	DC BIAS FOR PRESCALER INPUT; 1.4V DC
10	-	-
11	-	-
12	VBB	DC BIAS FOR REFERENCE DIVIDER INPUT; 1.4V DC
13	RIN	REFERENCE DIVIDER INPUT; 1V P-P, 2.1 MHz SQUARE WAVE RIDING ON 1.4V DC
14	VSS	IC GROUND; 0V
15	MRP	NOT USED
16	MIN	NOT USED
17	FR	REFERENCE DIVIDER OUTPUT; SAWTOOTH WAVEFORM AT 6.25 KHZ WHEN LOCKED
18	UP*	WHEN LOCKED, NARROW (<1US) DOWN PULSES AT 6.25 KHZ RIDING ON .7V DC
19	LOCK*	LOOP LOCKED; WHEN LOCKED, NARROW (<1US) DOWN PULSES AT 6.25 KHZ RIDING ON 5V DC
20	DOWN*	WHEN LOCKED, NARROW (<1US) DOWN PULSES AT 6.25 KHZ RIDING ON .7V DC



NOTES:
 1. UNLESS OTHERWISE INDICATED, ALL RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN PICOFARADS, AND INDUCTOR VALUES ARE IN MICROHENRIES.
 2. THE OUTPUT OF OPERATIONAL AMPLIFIER U2403D IS CONNECTED TO A PC BOARD RUNNER WHICH ENCIRCLES A CRITICAL PC BOARD RUNNER TO PROVIDE ADDITIONAL ISOLATION BETWEEN THE CRITICAL RUNNER AND GROUND.
 3. 10V REGULATOR U2805 IS HEATSINK MOUNTED TO THE RECEIVER MODULE CHASSIS.
 4. C2205 IS A LASER TRIMMED COMPONENT WITH A FINAL VALUE DETERMINED ON A PER BOARD BASIS. THIS COMPONENT IS CONSIDERED NON-REPLACEABLE.

REF. DESIG.	TYPE	DESCRIPTION	SUPPLY PIN	GROUND PIN
U2401	-	CUSTOM PHASE LOCKED LOOP SYNTHESIZER	2	14
U2402	MC74HC4068	QUAD ANALOG MULTIPLEXER/DEMULTIPLEXER	14	7
U2403	MC33184	LOW POWER QUAD OPERATIONAL AMPLIFIER	4	11
U2500	r/o	CUSTOM RECEIVER INTEGRATED CIRCUIT	2 (DIGITAL), 14, 23 (ANALOG)	3 (DIGITAL), 5, 15, 30, 47 (ANALOG)
U2503	MC74HC11	TRIPLE 3-INPUT AND GATE	14	7
U2505	MC33184	LOW POWER QUAD OPERATIONAL AMPLIFIER	4	11
U2701	MC145041	11-CHANNEL A/D CONVERTER	20	10, 13
U2701, 2702	MC7805	+5V VOLTAGE REGULATOR	-	-
U2800	MC74HC244	OCTAL 3-STATE NONINVERTING BUFFER/LINE DRIVER	20	10
U2801	MC74HC11	TRIPLE 3-INPUT AND GATE	14	7
U2802	MC74HC86	QUAD 2-INPUT EXCLUSIVE OR GATE	14	7
U2803	MC74HC32	DUAL 2-INPUT OR GATE	14	7
U2804	MC74HC139	DUAL 1-OF-4 DECODER/DEMULTIPLEXER	16	8
U2805	LM2940	+10V REGULATOR	-	-



VCO TROUBLESHOOTING

- Q2201 AND ASSOCIATED CIRCUITRY COMPRISE +8.7V SUPERFILTER. MEASURE VOLTAGE DROP ACROSS R2205 AND CALCULATE CURRENT (SHOULD BE APPROXIMATELY 45 MA). CIRCUITRY IS AT FAULT.
- IF BOARD IS NOT LOCKED, PERFORM FOLLOWING PROCEDURE TO DETERMINE IF VCO CIRCUITRY IS AT FAULT:
 - VERIFY DC VOLTAGES AS SHOWN ON SCHEMATIC
 - MEASURE POWER AND FREQUENCY AT OUTPUT OF C2219; SHOULD BE APPROXIMATELY +10 DBM INTO 50 OHMS. FREQUENCY SHOULD BE WITHIN RANGE
 - MEASURE STEERING LINE VOLTAGE AT U2405-PIN 1. IF BOARD IS NOT LOCKED, VOLTAGE WILL BE EITHER 5V OR 9V. VERIFY VCO OUTPUT FREQUENCY BASED ON MEASURED STEERING LINE VOLTAGE.

STEERING LINE VOLTAGE 5V APPROX. 813 MHZ
 STEERING LINE VOLTAGE +9V APPROX. 840 MHZ

A/D CONVERTER U2800 ACCEPTS VARIOUS ANALOG SENSE SIGNALS FROM KEY METERING POINTS ON THE RECEIVER BOARD. DESIRED SENSE LINE (AS SELECTED BY STATION CONTROL VIA MOSI DATA) IS CONVERTED TO DIGITAL FORMAT AND SENT SERIALLY TO STATION CONTROL (U2800-PIN 16).