VOLTAGE CHART FOR I. C. 's & VOLTAGE CHART FOR TRANSISTORS
19X

TRANSISTOR VOLTAGE CHART (DC)

CONDITIONS
MEASURED ON 19 CH
NO SIGNAL
NO MODULATION

TR.NO	101		102		103		104		105		201 RX SQ		202		203		206		207		301		302		303	
	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	MIN	MAX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX
B	2.1	0.2	2.3	0.3	2.4	0.3	1.3	0.1	0.6	0.3	0	0.7	0	0	0.7	0.7	9.0	9.0	8.3	7.6	0.3	0.5	0	0.01	0	0.3
C	11.8	12.8	10.8	12.8	7.8	12.8	12.5	12.9	0.1	0.3	0.7	0	0.01	0.03	0.07	0.07	12.8	12.1	1.2	8.3	13.1	13.0	13.3	8.4	13.3	10.4
E	1.5	0.2	1.6	0.1	1.7	0	0.6	0	0.02	0.04	0	0	0.01	0.01	0	0	8.4	8.4	8.4	8.3	0	1.0	0	0	0	0

IC VOLTAGE CHART (DC)

CONDITIONS
MEASURED NO 19 CH
NO SIGNAL
NO MODULATION

IC. NO	IC PIN NO	RX	TX
201	1	13.7V	13.5V
	2	12.6V	12.5V
	3	4.1V	4.0V
	4	8.2V	8.1V
	5	1.4V	1.3V
	6	3.4V	3.3V
	7	3.4V	3.4V
	8	1.4V	1.4V
	9	0 V	0 V
	10	6.8V	6.6V
202	1	7.7V	7.7V
	2	0.04V	0.04V
	3	0.03V	0.03V
	4	7.7V	7.7V
	5	7.7V	7.7V
	6	0.03V	0.03V
	7	0.03V	0.03V
	8	0.03V	0.02V
	9	0.03V	0.02V
	10	0.36V	0V
	11	3.5V	3.5V
	12	3.7V	3.7V
	13	0V	0V
	14	0.8V	4.5V
	15	1.7V	1.6V
	16	1.7V	1.6V
	17	1.6V	3.0V
	18	7.7V	7.7V
	19	3.6V	3.6V
	20	7.5V	0.8V
203	1	2.6V	2.6V
	2	1.9V	1.9V
	3	1.4V	1.4V
	4	1.9V	2.6V
	5	0V	0V
	6	1.3V	7.8V
	7	2.1V	2.1V
	8	5.2V	5.4V
	9	1.3V	7.8V

0 = 0
1 = 8

19X TRUTH TABLE

CHANNEL	PIN # 1	2	3	4	5	6
1	1	0	0	0	0	0
2	0	1	0	0	0	0
3	1	1	0	0	0	0
4	0	0	1	0	0	0
5	1	0	1	0	0	0
6	0	1	1	0	0	0
7	1	1	1	0	0	0
8	0	0	0	1	0	0
9	1	0	0	1	0	0
10	0	0	0	0	1	0
11	1	0	0	0	1	0
12	0	1	0	0	1	0
13	1	1	0	0	1	0
14	0	0	1	0	1	0
15	1	0	1	0	1	0
16	0	1	1	0	1	0
17	1	1	1	0	1	0
18	0	0	0	1	1	0
19	1	0	0	1	1	0
20	0	0	0	0	0	1
21	1	0	0	0	0	1
22	0	1	0	0	0	1
23	1	1	0	0	0	1
24	0	0	1	0	0	1
25	1	0	1	0	0	1
26	0	1	1	0	0	1
27	1	1	1	0	0	1
28	0	0	0	1	0	1
29	1	0	0	1	0	1
30	0	0	0	0	1	1
31	1	0	0	0	1	1
32	0	1	0	0	1	1
33	1	1	0	0	1	1
34	0	0	1	0	1	1

0 = 0

1 = 8

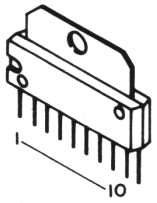
19X TRUTH TABLE

CHANNEL	PIN # 1	2	3	4	5	6
35	1	0	1	0	1	1
36	0	1	1	0	1	1
37	1	1	1	0	1	1
38	0	0	0	1	1	1
39	1	0	0	1	1	1
40	0	0	0	0	0	0

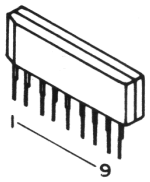
SEMICONDUCTOR PIN CONFIGURATION
19X

INTEGRATED CIRCUITS

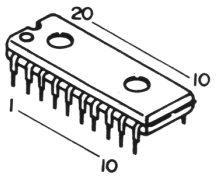
KIA 7205CP



TA7310P or AN103



LC7131



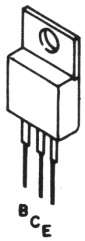
TRANSISTORS

MPS9623
MPS9631
MPS9634
MPS9681
MPS9418

MPS9426

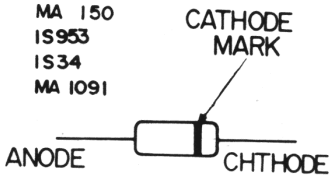
2SC1957 or 2SC2314

2SC2078 or 2SC1306

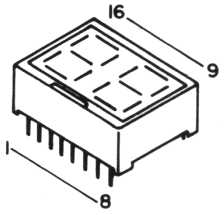


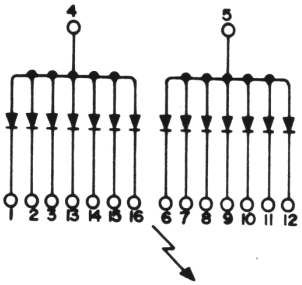
DIODES

IN 4002
MA 150
IS953
IS34
MA 1091



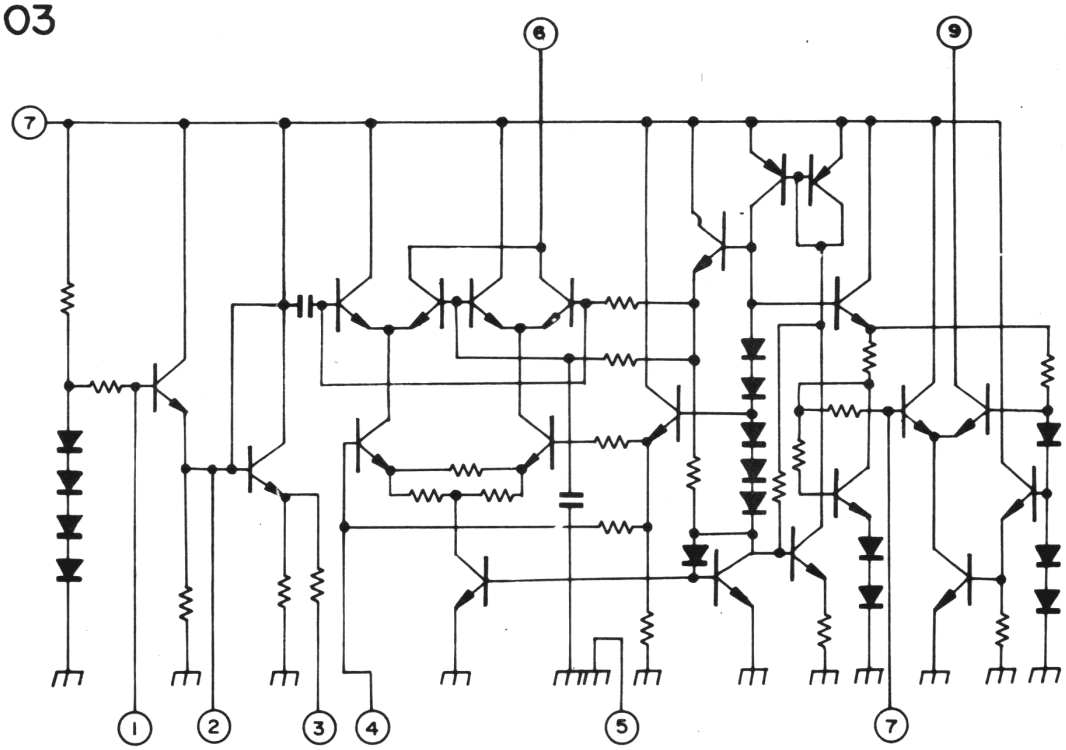
KLR321



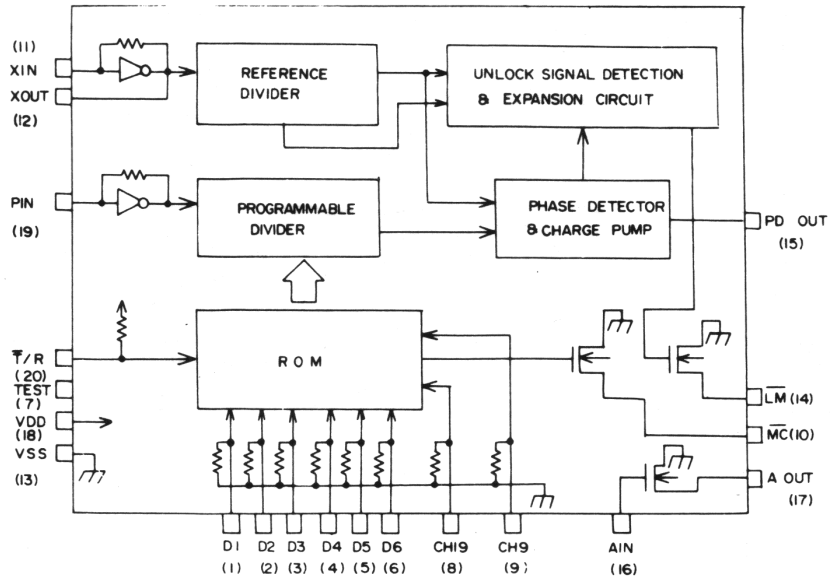


INTERNAL DIAGRAM – IC'S
19X

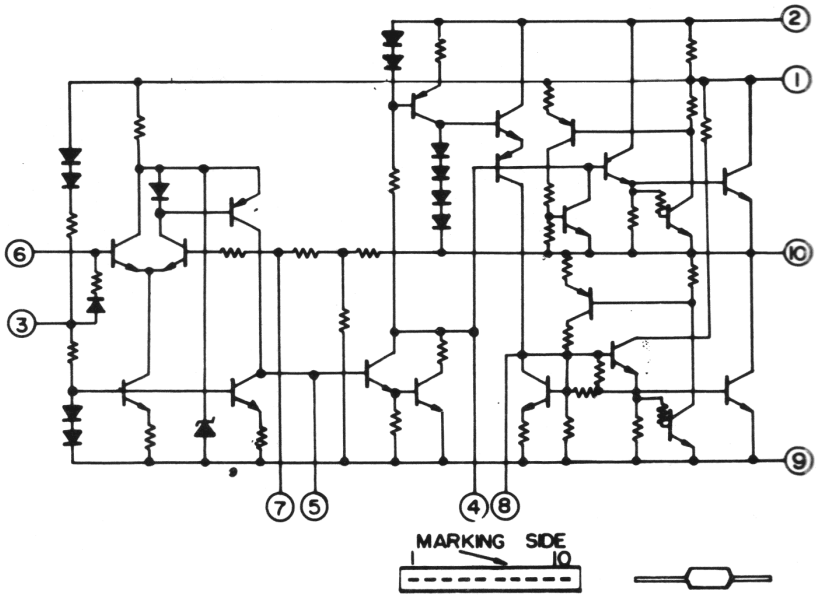
AN103



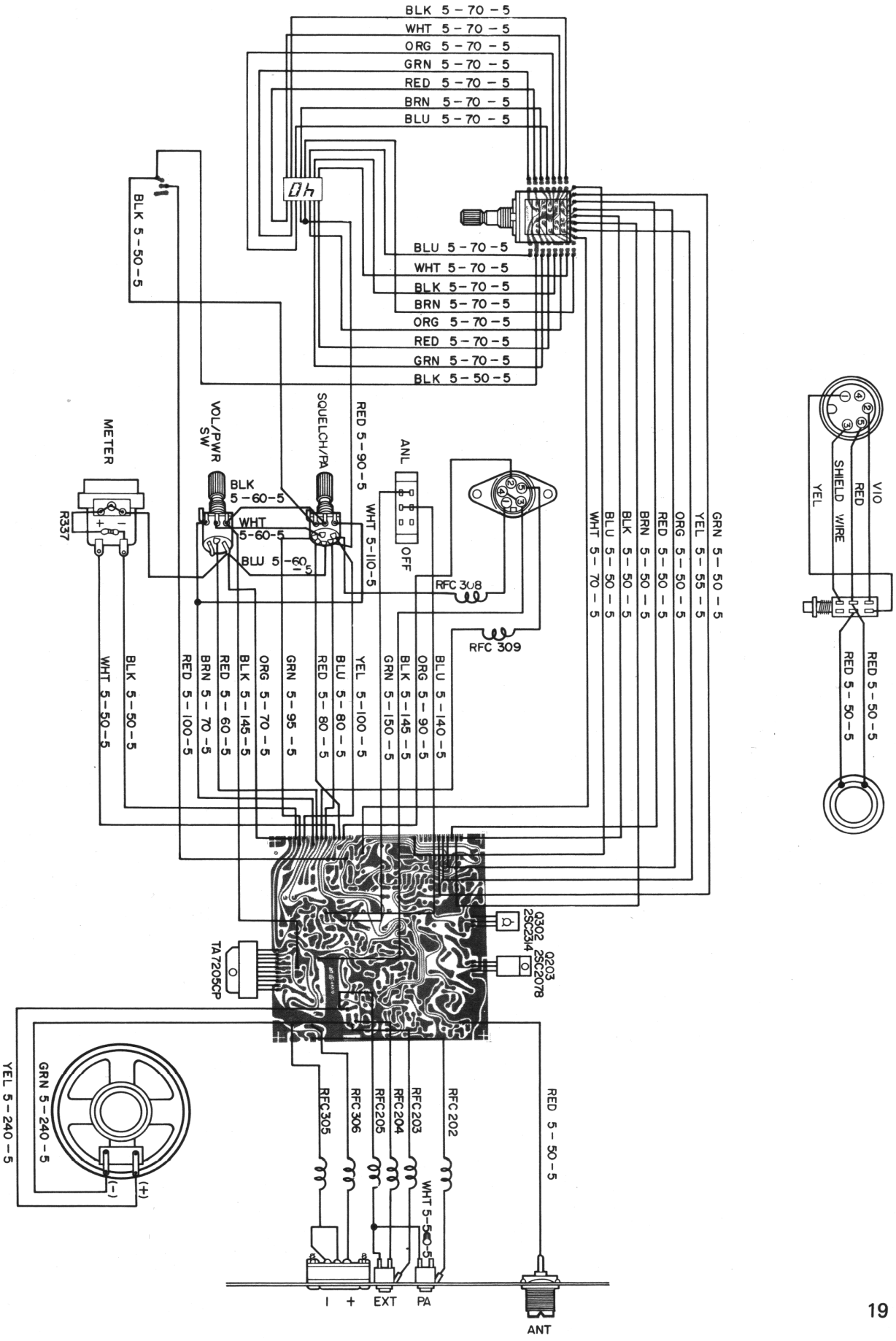
LC7131



KIA7205CP



WIRING DIAGRAM
19 X



CIRCUIT SYMBOL	DESCRIPTION	PART NUMBER
----------	Escutcheon	380-408-9-001
----------	Overlay	260-283-9-001
----------	Lens (LED Display)	158-041-9-001
----------	Knob (Channel)	751-209-9-001
----------	Knob (Control)	751-209-9-002
----------	Meter (Power)	320-109-9-001
----------	Volume (50KA W/S.W.)	008-407-9-001
----------	Volume, Squelch (10KG W.O./S.W.)	008-407-9-002
----------	Rotary Switch	083-274-9-001
----------	Slide S.W.	084-099-9-001
----------	Ant. Receptacle	772-046-9-001
----------	Earphone Jack	773-108-9-001
----------	Speaker 3" 8ohm 2W	580-136-9-001
----------	Power Cord Ass'y.	420-040-9-001
----------	Housing (3P Connector)	779-019-9-001
----------	Lug Plate (3P)	744-032-9-001
----------	Cabinet Cover (Upper)	253-104-9-001
----------	Cabinet Cover (Bottom)	252-043-9-001
----------	Bracket (Mounting)	251-522-9-001
----------	Lever (Mic)	265-027-9-001
----------	Holder (Mic)	251-515-9-001
----------	Cartridge	769-116-9-001
----------	Push S.W. (P-M1 Block)	088-071-9-001
----------	Coiled Cord w/ Din Plug (Mic)	426-083-9-001
----------	Cord Wire (Coiled)	420-040-9-002
----------	Plug (5P)	775-058-9-001
Q 105, 301	Transistor, MPS9426 (B)	177-052-9-001
Q 101, 102	Transistor MPS9426 (C)	176-115-9-001

CIRCUIT SYMBOL	DESCRIPTION	PART NUMBER
Q 103	Transistor, MPS9623 (H)	176-125-9-001
Q 104	Transistor MPS9623 (I)	176-115-9-002
Q 201-203	Transistor, MPS9634 (C)	176-128-9-001
OR		
Q 201-203	Transistor, MPS9634 (D)	176-115-9-003
Q 206	Transistor, MPS9418 (T)	176-115-9-004
Q 207	Transistor MPS9681 (T)	177-049-9-001
Q 302	Transistor, 2SC1957	172-059-9-001
OR		
Q 302	Transistor, 2SC2314 (E)	176-120-9-001
Q 303	Transistor, 2SC1306	172-024-9-002
OR		
Q 303	Transistor, 2SC2078 (E)	172-062-9-001
IC 201	IC 7205 CP	307-272-9-001
OR		
IC 201	IC KIA7205P	307-107-9-003
IC 202	IC LC131	307-272-9-002
IC 203	IC AN 103	307-272-9-003
OR		
IC 203	IC TA7310P	307-133-9-004
----------	LED (Display) TH2010 (0.4")	238-019-9-001
D 208	LED (Lamp) IN 23	158-045-9-001
D 201	Varicap Diode 151658	154-008-9-001
T 201	Transformer (Output)	061-047-9-001
CH 301	Transformer (Choke)	042-041-9-001
RFC 201, 307	Choke Coil 25uH	041-134-9-001
RFC 308, 309	Choke Coil 22uH	041-134-9-002
RFC 305, 306	Choke Coil 10uH	041-134-9-003
RFC 303	Choke Coil 6.8uH	041-134-9-004
RFC 101	Choke Coil 1.5uH	041-134-9-005
RFC 202-205	Choke Coil iuH (Spring Type)	041-134-9-006
RFC 302	Choke Coil 1uH (Bobbin Type)	041-134-9-007
RFC 304	Choke Coil 0.5uH (Spring)	041-134-9-008

PARTS LIST CONT'D
19X

CIRCUIT SYMBOL	DESCRIPTION	PART NUMBER
L 205	Choke Coil 0.45uH	046-039-9-001
L 101	IFT Coil 27MHz	046-039-9-002
L 102	IFT Coil 27MHz	046-039-9-003
L 103, 104, 204	IFT Coil 10.6MHz	046-039-9-004
L 105	IFT Coil 455KHz	046-039-9-005
L 106	IFT Coil 455KHz	046-039-9-006
L 107	IFT Coil 455KHz	046-039-9-007
L 301	IFT Coil 27MHz	046-039-9-008
L 302	IFT Coil 27MHz	046-039-9-009
L 303	IFT Coil 27MHz	046-039-9-010
L 304	IFT Coil 27MHz	046-039-9-011
L 307	IFT Coil 27MHz	046-039-9-012
L 305	IFT Coil 27MHz	046-039-9-013
L 306	IFT Coil 27MHz	046-039-9-014
L 203	IFT Coil V.C.O.	046-039-9-015
CF 2	Ceramic Filter CFU455HT or EFC-L455K40B	140-026-9-001
CF 1	Ceramic Filter (10.5MHz) SPE10.7MJ	140-026-9-002
X 201	Crystal (HC-18/U Type) 10.240MHz	132-036-9-001
RV 103, 202	Semifixed Resistor 20K ohm (B): 8ø	008-407-9-003
RV 101, 201	Semifixed Resistor 10K ohm (B): 8ø	008-407-9-004
R 215	Metaloxide Resistor 10 ohm 2W	013-063-9-001
R 330	Metaloxide Resistor 10 ohm 1W	011-001-5-100
C 112	Capacitor Poly 470pF 50WV 5%	025-182-9-001
C 223, 360	Capacitor Elec. 220uF 16WV	022-227-9-001
C 221, 225, 228, 303	Capacitor Elec. 47uF 16WV	022-227-9-002
C 128, 214	Capacitor Elec. 33uF 16WV	022-227-9-003
C 207, 211, 209	Capacitor Elec. 10uF 16WV	022-227-9-004

CIRCUIT SYMBOL	DESCRIPTION	PART NUMBER
C 125	Capacitor Elec. 3.3uF 16WV	022-227-9-006
C 123	Capacitor Elec. 2.2uF 16WV	022-227-9-007
C 222	Capacitor Elec. 0.47uF 16WV	022-227-9-008
C 217	Capacitor Elec. 33uF 10WV	022-227-9-009
C 210	Capacitor Elec. 47uF 6.3WV	022-158-9-007
C 213	Capacitor Elec. 1uF 50WV	022-227-9-011
----------	P.C.B. (LED Lamp)	302-542-9-001
----------	P.C.B. (LED Display)	302-539-9-001
----------	P.C.B. (S.W.)	302-543-9-001
----------	Snow Box	500-503-9-001
----------	Inner Box	500-503-9-002
----------	Microphone	562-028-9-001

19 LTD
UNIT SPECIFICATIONS & FREQUENCY LISTING

GENERAL

Channels	40.
Frequency Range	26.965 to 27.405 MHz.
Frequency Control	Phase Lock Loop (PLL) synthesizer.
Frequency Tolerance	0.005%.
Operating Temperatur-e Range	-30°C to +50°C.
Microphone	Plug-in type; dynamic.
Input Voltage	13.8 VDC nom. (positive or negative ground).
Current Drain	*Transmit:* AM full mod., 1.5A (maximum).
	Receive: Squelched, 0.25A; full audio output 1.0A (nominal).
Size	8-1/16"D x 5-1/2"W x 1-1/2"H.
Weight	2.7 pounds.
Antenna Connector	UHF, SO-239.
Semiconductors:	16 transistors, 18 diodes, 3 integrated circuits.
Meter	Illuminated; indicates relative power output and received signal strength.

TRANSMITTER

Power Output	4 watts.
Modulation	High- and low-level, Class B amplitude modulation.
Frequency Response	300 – 3000 Hz.
Output Impedance	50 ohms, unbalanced.

RECEIVER

Sensitivity	Less than 1μV for 10 dB(S+N)/N.
Selectivity	6 dB @ 7 KHz, 60 dB @ 10 KHz.
Image Rejection	80 dB, typical.
Adjacent-Channel Rejection	60 dB, typical.
IF Frequencies	Double conversion, 1st: 10.695 MHz. 2nd: 455 KHz.
Automatic Gain Control (AGC)	Less than 10 dB change in audio output for inputs from 10 to 50,000 microvolts.
Squelch	Adjustable; threshold less than 1μV.
Audio Output Power	4 watts.
Frequency Response	300 – 3000 Hz.
Distortion	Less than 7% @ 3 watts @ 1000 Hz.
Built-in Speaker	16 ohms, round.
External Speaker (Not Supplied)	8 ohms; disables internal speaker when connected.

PA SYSTEM

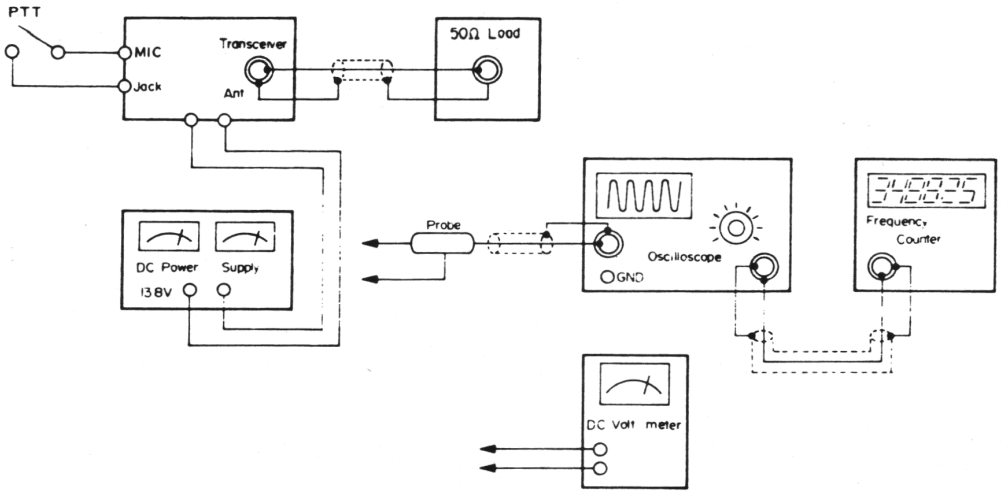
Power Output	4 watts into external speaker.
External Speaker for PA (Not Supplied)	8 ohms; when PA-CB switch is in PA, the PA speaker also monitors the receiver; separate jack provided.

CLASS D CB CHANNELS

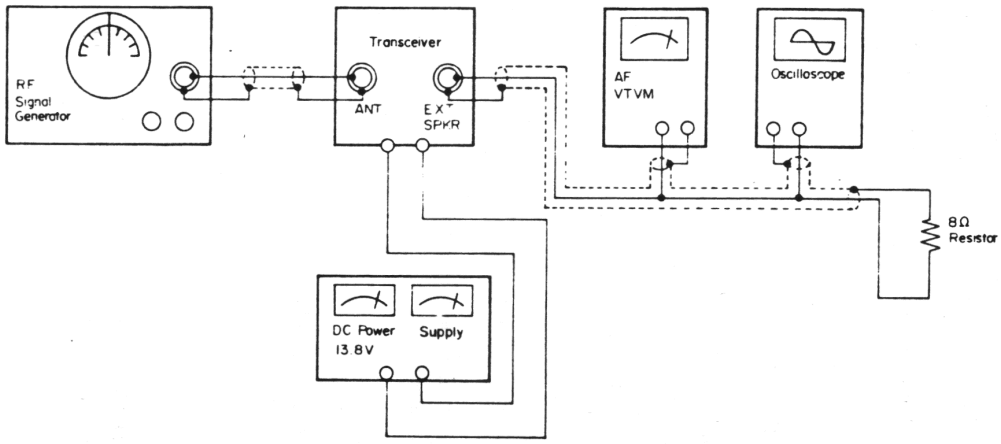
Channel	MHz	Channel	MHz	Channel	MHz	Channel	MHz
1	26.965	11	27.085	21	27.215	31	27.315
2	26.975	12	27.105	22	27.225	32	27.325
3	26.985	13	27.115	23	27.255	33	27.335
4	27.005	14	27.125	24	27.235	34	27.345
5	27.015	15	27.135	25	27.245	35	27.355
6	27.025	16	27.155	26	27.265	36	27.365
7	27.035	17	27.165	27	27.275	37	27.375
8	27.055	18	27.175	28	27.285	38	27.385
9	27.065	19	27.185	29	27.295	39	27.395
10	27.075	20	27.205	30	27.305	40	27.405

TEST EQUIPMENT SET–UP
19 LTD

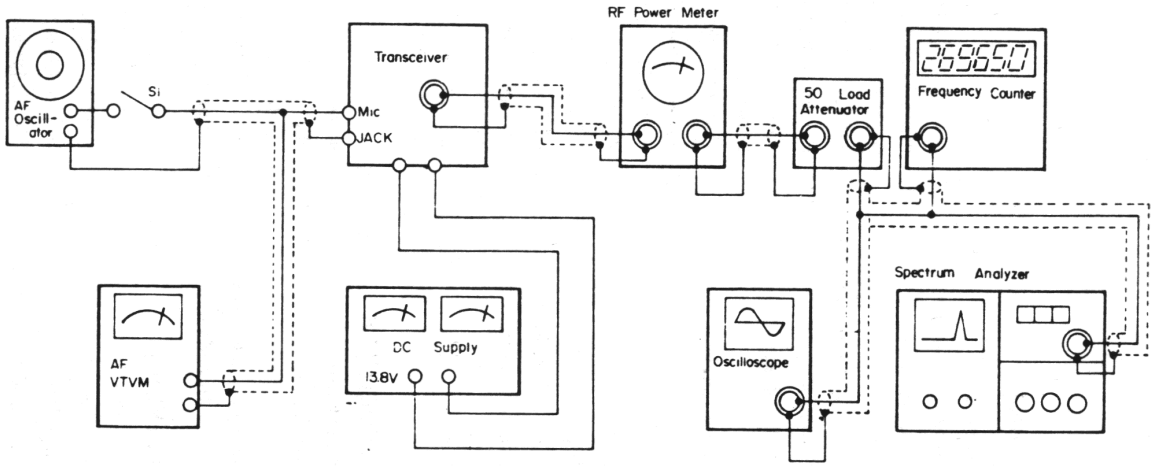
PLL AND CARRIER SECTION



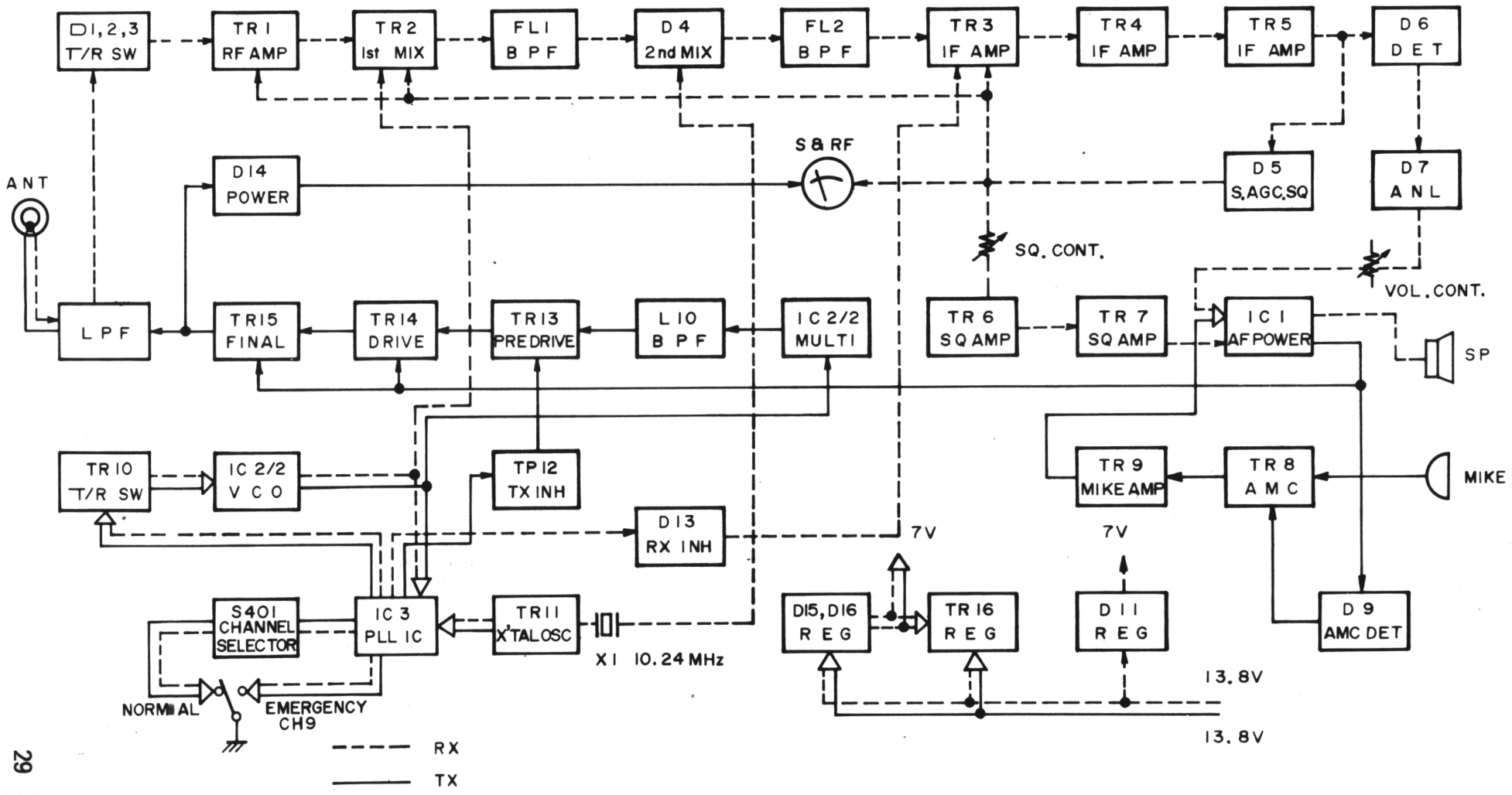
RECEIVER SECTION



TRANSMITTER SECTION



19 LTD
BLOCK DIAGRAM



ALIGNMENT INSTRUCTIONS

Caution: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with a 13.8 volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect 50-ohm dummy load or antenna before keying transmitter. Connect microphone.

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP 4 (IC 3 Pin 2).	Ch. 19		Check for 10.240MHz
Input of DC meter to TP 1 (IC 3 Pin 7).	Ch. 19	L 9	Adjust for 3.00 volts. Check for approx. 4.00 volts channel 40.
Input of DC meter to TP 1 (IC 3 Pin 7)	Ch. 1, XMT		Check for 1.85 volts. Check for approx. 4.48 volts on channel 40
Input of oscilloscope to TP 3 (L 3 Secondary)	Ch. 19	L 3	Adjust for maximum RF. (80mV typical) (See figure 1)
Input of frequency counter to TP 5 (IC 2 Pin 3)	Ch. 1		Check for 16.270MHz Check all channels. See Synthesizer Chart for correct frequencies.
Input of frequency counter to TP 6 (IC 2 Pin 6)	Ch.1, XMT		Check for 26.965MHz Check all channels. See Synthesizer Chart for correct frequencies.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector. Note: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19	L 10, 11, 12	Adust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19	L 15	Adjust for 4.0 watts RF output maximum.