

PA SPEAKER JACK

A standard miniature phone plug fits this jack on the rear panel, and provides for connection of an external public address speaker.

ANTENNA CONNECTOR

A standard PL-259 coaxial connector fits this connector on the rear panel. The output impedance is 50 ohms.

B. Good CB Practices

In order that all CB operators may obtain maximum benefit from their CB radio station, the D.O.C. strongly urges all CB radio operators to observe the following "Good CB Practices":

1. Channel Selection

In selecting a channel for your station, it is very important that the following factors be considered:

- a. There are only a limited number of channels available for use by all CB stations.
- b. Channel 9 may be used for emergency communications only (situations which require immediate assistance to a motorist, etc.).
- c. Any one of the other channels are to be used to conduct personal and business radio communications.
- d. Prevent unintentional "bleed over" interference to channel 9. It is recommended that all transmissions involving highway travelers be conducted on a channel other than channel 8 or 10.

2. Channel Usage

Cooperate to the fullest extent possible in sharing the CB channels. Always be courteous and considerate when using a channel. In order to assure that all CB operators will have an equal opportunity to use the frequencies, radio communications between CB stations (interstation) must be limited to no longer than 5 continuous minutes to be followed by a silent period of at least one minute. Operators should restrict their time on the air to a practical minimum.

The importance of all CB users disciplining themselves from needlessly transmitting for long periods of time cannot be stressed enough.

3. Identification

Identify your radio transmissions with your own D.O.C. issued call sign before and after each transmission. This call sign is unique in that it is unlike any other CB radio station call sign. Be proud to identify your radio transmissions with it. "Nicknames" or "handles" may also be used to identify your radio transmissions provided they are accompanied by the D.O.C. assigned call sign. It is not necessary to transmit the call sign of the station with whom you are talking.

4. Equipment

Have frequency, power and modulation measurements made at regular intervals. Do not tamper with the equipment. A licensed commercial technician is required to perform any adjustments that might affect the proper operation of the transceiver.

5. Promote "Good CB Practices"

Encourage other CB users to follow the above suggested practices.

If all CB users make a serious attempt to understand and follow the above recommended practices, we believe efficient utilization of the shared CB channels will be maximized.

CHANNEL FREQUENCY CHART

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

RECEIVER OPERATION

1. Set the front panel controls as follows:

CHANNEL SELECTOR	to	Desired Channel
TONE SWITCH	to	Out
NOISE BLANKER	to	Out
(NL/B) SWITCH		
PA SELECTOR	to	Out
SQUELCH CONTROL	to	Full CCW
RF GAIN CONTROL	to	Full CW
VOLUME CONTROL	to	1/2 Rotation CW

2. Rotate the CHANNEL SELECTOR and locate an incoming signal.
3. Adjust the VOLUME CONTROL as desired.

4. If a very strong signal is being received, set the RF Gain control CCW and observe that the audio level is reduced. Readjust the VOLUME as required.
5. The S-Meter will indicate the strength of the station being received. A reading of 1 to 4 indicates a distant or low power signal. A reading of 5 to 9 indicates a higher power or local station.
6. Squelch Adjustment
 - 1) Locate a channel where there is no signal and rotate the SQUELCH CONTROL from full CCW to a point where the noise just stops.
 - 2) Rotate the CHANNEL SELECTOR to a channel where there is a signal and observe that the audio comes through loud and clear.
 - 3) Do not set the SQUELCH CONTROL too far past the quiet point, as weak signals may not overcome the squelch and will not be heard.

7. Noise Blanker

When there is excessive electrical disturbance, set the Noise Limiter/Blanker (NL/B) switch to the IN position, observe that the noise is reduced and the signal is received clearly.

8. Tone Switch

Set Tone Switch to preferred position.

TRANSMITTER OPERATION

BEFORE TRANSMITTING, IT IS MANDATORY THAT YOUR TEMPORARY OR PERMANENT LICENSE BE POSTED WITH YOUR TRANSMITTER.

1. Set the front panel controls as follows:

CHANNEL SELECTOR	to	Desired Channel
PA SWITCH	to	Out
SQUELCH CONTROL	to	Noise Quiet Point
RF GAIN CONTROL	to	As Set for Receive
VOLUME CONTROL	to	1/2 Rotation CW

2. Select a clear channel or wait for an opportunity to "break-in" on a desired channel.
3. Position the microphone approximately 2 inches from your mouth and hold the Press-to-Talk switch down. Speak in a normal tone and level of voice, do not speak for more than two minutes. Release the Press-to-Talk switch and listen for the reply.

PUBLIC ADDRESS AND EXTERNAL SPEAKER OPERATION

1. Public Address Speaker (Figure 5)

With the PA/CB switch in the PA position, and speaker plugged into the PA jack, press the transmit switch and speak into the microphone. Use the transceiver volume control to set the audio level at the PA speaker. When the CB/PA switch is in the PA position all other functions of the transceiver are turned off.

2. External Speaker (Figure 5)

When the external speaker is used, the internal speaker is disconnected. The volume control functions as normal.

SECTION IV, TECHNICAL DATA/SERVICE & MAINTENANCE

General Description

The RANGLER 40 D is an AM Citizens Radio Service Band Transceiver. The unit incorporates the most advanced design in Phase Locked Loop (PLL) Frequency Synthesizer circuitry for the generation and precision control of 40 channel frequencies.

The transceiver is designed to operate in vehicles using power supplies providing 13.8 Vdc. The unit may also be used in base station installations when used with a 13.8 Vdc external power source.

Special Features:

- * Electronic Switching
- * Self-contained Heavy Duty Speaker
- * Digital Channel Indicator
- * Illuminated S/RF Power Meter
- * Channel Selector
- * On-the-Air Indicator
- * Volume Control - with Power ON/OFF Switch
- * Squelch Control
- * Noise Limiter/Blanking Switch
- * External speaker and PA jacks
- * Operates from 13.8V DC (positive or negative ground)
- * Coaxial Antenna Connector - 50 ohm impedance
- * Under dash mounting bracket for mobile installation
- * Phase Locked Loop (PLL) Frequency Synthesizer
- * Low Noise RF Stages
- * Public Address Mode
- * Automatic Transmit Inhibit Circuit
- * RF Gain Control
- * Automatic Level Control (A.L.C.)

Nominal Specifications

General

Operating Temperature Range - 30°C to +50°C

Solid State Devices

Transistors - 24

FETs - 3

Diodes - 21

Integrated Circuits (IC) - 2

Varicaps - 1

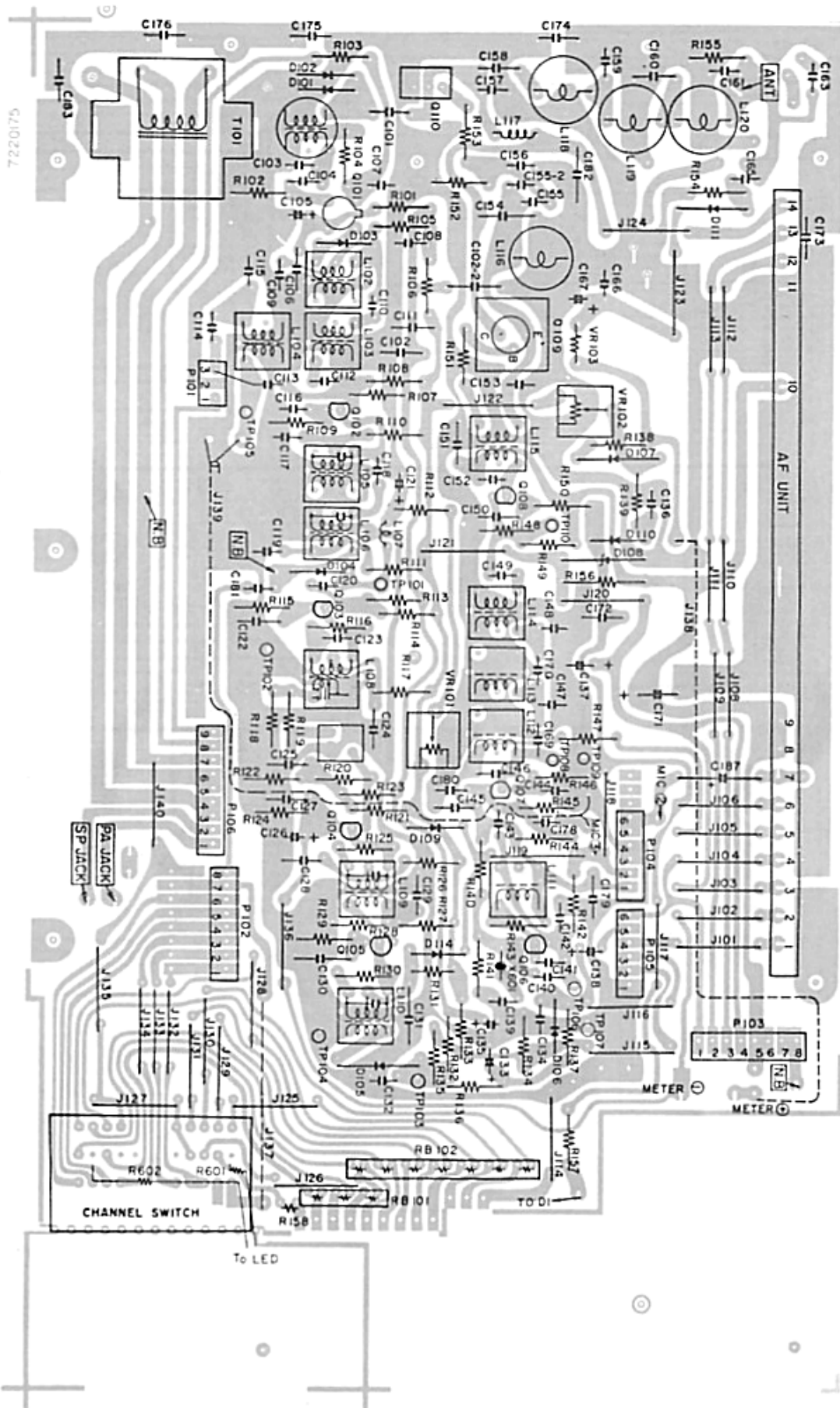
Zener Diodes - 2

RECEIVER SECTION

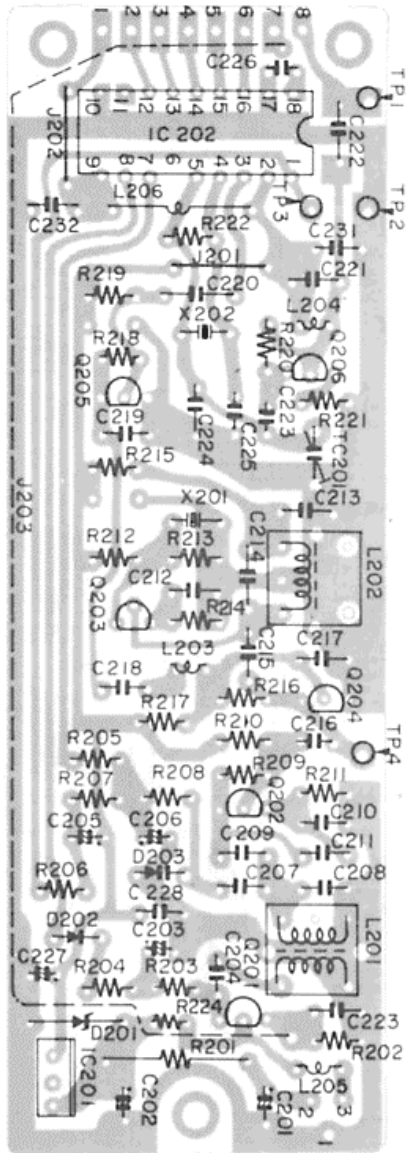
* Frequency Range	26.965 to 27.405 MHz
* Sensitivity	0.25uV for 10db S/N at 1 kHz at 30% Modulation
* Selectivity	BW 2.5 kHz min. at 6db dwn.
* Adj. Channel Rejection	Better than 60db
* Audio Distortion at 1 kHz	Less than 10% at 3W
* Squelch Sensitivity	0.2uV
* Squelch Stop Sensitivity	45 to 30,000uV (adjustable)
* Noise Limiter	Series Gate

TRANSMITTER SECTION

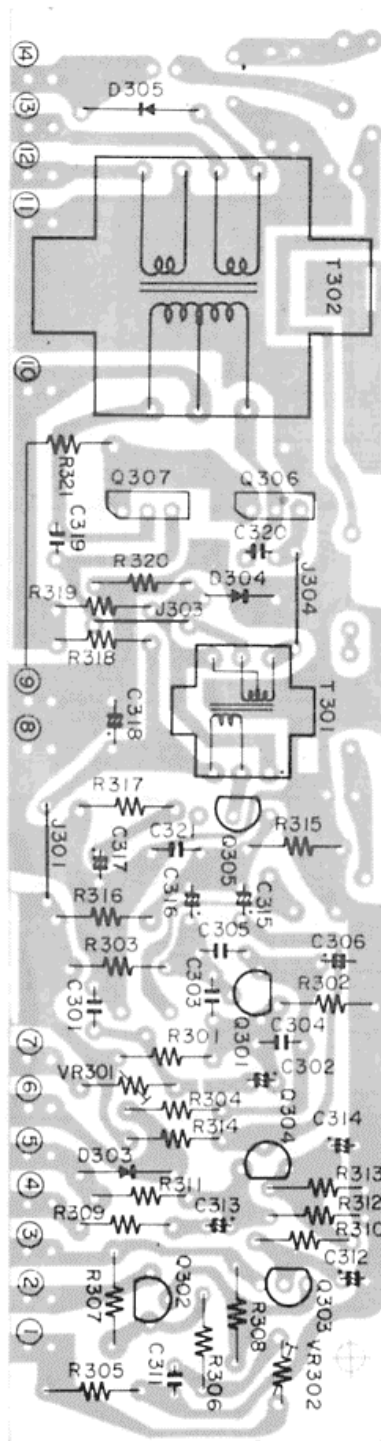
* Frequency Range	26.965 to 27.405 MHz
* Power Output at 13.8 V DC	3.5 to 4 watts
* Modulation (4mV at microphone)	100%
* Emission (Class D operation)	6A3
* Hum and Noise	Better than 40db down
* Frequency Tolerance	Better than $\pm .005\%$
* Antenna Impedance	50 ohms
* Switching	Electronic
* Modulation Distortion	Less than 10% at 95% modulation at 1 kHz



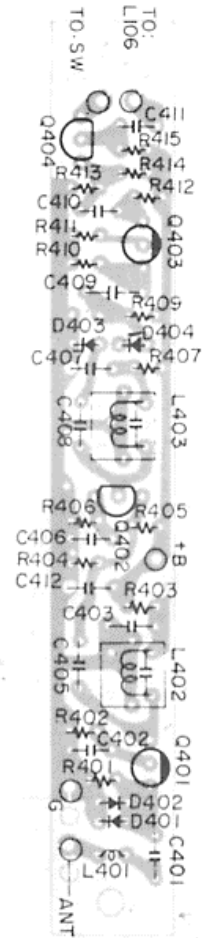
MAIN BOARD
LOCATION DIAGRAM ISSUE A



PLL SYNTHESIZER



AUDIO



NOISE LIMITE

FIGURE 8 COMPONENT

SERVICE AND MAINTENANCE

WARNING

MODIFICATION TO THE TRANSMITTER SECTION IN ANY WAY NOT RECOMMENDED BY COURIER COMMUNICATIONS IS ILLEGAL. MODIFICATIONS INCLUDE, BUT NOT LIMITED TO, SUBSTITUTION OF CRYSTALS, REPLACEMENT OF COMPONENT PARTS NOT OF THE SAME ELECTRICAL RATING, ADDITION OF ANY COMPONENT PART(S), CONNECTIONS, DEVICE OR ACCESSORY INTERNALLY TO THE TRANSMITTER.

Should your unit require service for any reason, please refer to the enclosed Authorized Warranty Station List for assistance and location in your area.

Troubleshooting assistance may be obtained by writing to COURIER COMMUNICATIONS, 80 Alexdon Road, Downsview, Ontario M3J 2B4. Address your inquiry to the attention of the Customer Service Department. Always state the Model, Serial Number and Issue of Schematic Diagram to which the unit was built. The schematic issue letter may be found in the lower right hand corner of the schematic or from the legend on the printed circuit board.

When ordering parts, refer to the part number listed in the Replacement Parts List and give a description of the part. Mail to attention of parts Department.

SPECIAL REPLACEMENT PARTS LIST

SYMBOL	DESCRIPTION	PART NUMBER
SOLID STATE DEVICES		
Q102,103,106, 107	Transistor, 2SC1675	2022-03
Q104,105,301, 302,304,308	" 2SC945 (R)	1043-07
Q108,305	" 2SC815 (L)	1040-155
Q109	" 2SC781	1009-03
Q110	" 2SC1306 (I)	2022-04
Q303	" 2SA539 (L)	2020-01
Q306,307	" 2SC1096 (ZL)	2017-108
Q401,403	" 2SK19 (GR)	1009-127
Q402	" 2SC839 (H)	1077-07
Q404	" 2SC944	2022-05
Q101	FET, 3SK39 (P)	2022-06
D101,102,106, 109,110, 114,303,401, 402	Silicon Diode, 1S953	1041-66
D105,107	" " 21K60	2022-07
D108	" " RD-9.1FB	2023-41
D111	" " 1N60	294-42-9
D112	" " F-14A	2022-08
D305	" " SRIK-2	1042-17
D1	LED, Transmit Indicator	2061-09
D304	Varistor, 1S1209	2017-111
D103,104,403, 404	Silicon Diode, 1S1555	1041-66
CRYSTALS		
X101	10.695 MHz	2061-29
COILS AND TRANSFORMERS		
L101	Antenna Coil	2022-132
L102,103	RF Coil	2022-116
L104	Osc. Coil	2022-134
L105,106	1st IF Trans.	2022-135
L107	Filter Coil	2022-122

SPECIAL REPLACEMENT PARTS LIST (Continued)

SYMBOL	DESCRIPTION	PART NUMBER
COILS AND TRANSFORMERS (Continued)		
L108	Mechanical Filter	2022-117
L109	IF Transformer	2022-123
L110	IF Transformer	2022-125
L111	TX. Osc. Coil	2022-133
L112,113	Filter Coil	2022-126
L114	" "	2022-127
L115	RF Coil	2022-128
L116,120	Filter Coil	2022-129
L117	Power Choke Coil	2022-119
L118	Filter Coil	2022-130
L119	RF Coil	2022-131
L401	Filter Coil SD10M	2061-67
L402	RF Coil 26 MHz	2061-68
L403	RF Coil 14 MHz	2061-69
T101	Choke Transformer	2061-39
T301	Transformer, low freq. (input)	2022-114
CONTROLS		
	3-gang push switch	2022-195
	Rotary switch, channel selector assy.	2061-17
VR1	Squelch Control/RF Gain Control	2061-24
VR2	Volume Control w/switch	2061-25
VR101,102	Variable Resistor 10K ohm	2061-26
VR103	" " 50K "	2023-40
VR301,302	" " 1K "	2061-27
FILTERS		
CF101	Ceramic Filter LFB-8	2022-118
CAPACITORS		
C165	Ceramic 2pF 50V	2022-75
C170	" 3pF "	2022-76
C157	" 5pF "	2022-77
C155-2,169	" 10pF "	160-01-9

SPECIAL REPLACEMENT PARTS LIST (Continued)

SYMBOL	DESCRIPTION	PART NUMBER
CAPACITORS (Continued)		
C110,118	Ceramic 12pF 50V	2022-78
C163	" 15pF "	2062-08
C101,181	" 22pF "	2022-79
C113,143	" 27pF "	2055-147
C139,153,153-2	" 33pF "	2022-136
C103,178	" 47pF "	2022-81
C115	" 68pF "	2022-83
C141	" 82pF "	2022-84
C104,140,146, 147,152,161, 13	" 100pF "	2022-82
C155	" 120pF "	2018-07
C148	" 150pF "	2022-86
C123,142	" 470pF "	2022-72
C130,131,154, 182	" 0.1mfd "	2022-71
C107,112,114, 136,144,158, 311,402,403, 406,407,411, 412,8,9,10	" 0.010mfd "	2022-68
C120,410	" 0.001mfd "	2022-73
C103,109,116, 117,119	" 0.022mfd "	2022-69
C102,102-2, 106,111,122, 124,125,127, 128,129,145, 150,151,172, 173,174,175, 176,179,183	" 0.0047mfd "	2022-70
C322	" 330pF "	2061-62
C132	Mylar 0.01mfd "	2022-246
C134,304	" 0.022mfd "	2061-83
C303	" 0.033mfd "	2061-82
C305	" 4700pF "	2061-81
C319,320	" 8200pF "	2022-103
C149,162,180, 409	Mica 150pF "	2022-89

SPECIAL REPLACEMENT PARTS LIST (Continued)

SYMBOL	DESCRIPTION	PART NUMBER
CAPACITORS (Continued)		
C159	Mica 220pF 50V	2022-91
C160	" 300pF "	2022-94
C405,408	" 47pF "	2061-71
C105,133,135, 138	Electro-lytic 1mfd 16V	2022-104
C302,313,314, 315,316	" 1mfd 50V	1011-40
C121,167	" 2.2mfd 16V	2022-105
C312	" 2.2mfd 50V	2061-80
C126	" 4.7mfd 16V	2022-107
C310	" 4.7mfd 50V	1076-41
C306,317	" 47mfd 16V	2022-108
C137,318	" 220mfd "	2022-109
C171	" 1000mfd "	2022-111
MISCELLANEOUS		
	AMC Module	2061-79
	Bracket, car mounting	2022-217
	Cabinet, Front	2061-01
	Case, Bottom	2061-03
	Case, Top	2061-02
J4	Connector, Antenna	2061-28
	DC cord w/fuse holder	2022-229
	Fuse 2A	2022-234
J1,2	Jack, EXT. SP & PA	2022-225
	Knob, Channel Selector	2061-04
	" ON/OFF/Volume Control	2061-05
	" RF Gain	2061-07
	" Squelch	2061-06
	Noise Blanker Module	2061-78
	Pilot Lamp (meter lighting)	2022-227
	PLL Module	2061-77
	Push Button, PA,NL/B, Tone	2022-228
J3	Receptacle 4-pin	2022-224
SP1	Speaker (16 ohm 3W)	2061-22
M1	S/RF Meter	2061-21
	Channel selector dial	ART359
	CMM-1 Microphone Assy.	2017-116

SPECIAL REPLACEMENT PARTS LIST (Continued)
PLL SYNTHESIZER

SYMBOL	DESCRIPTION	PART NUMBER
	PLL Module Assembly	2061-77

This assembly consists of the following:

SOLID STATE DEVICES

Q201,202,203, 204,205,206	Transistor, 2SC1675	2022-03
D201	Diode Silicon, RD9.1FB	2023-41
D202	" " 1SS53	2061-44
D203	" " 1SV50 (Varicap)	2061-45
IC201	I.C. uPC14305	2061-42
IC202	I.C. REC86345	2061-43

CRYSTALS

X201	10.24 MHz	2049-05
X202	36.38 MHz	2061-49

COILS AND TRANSFORMERS

L201,202	Coil, Osc.	2022-134
L203	" Filter S101 K	2061-46
L204	" " S2R2K	2061-47
L205	" " S330K	2061-48

CAPACITORS

C215,216	Ceramic 2pF	50V	2052-41
C223	" 3pF	"	2061-53
C204	" 10pF	"	1002-72
C222	" 22pF	"	2022-79
C208	" 27pF	"	2061-64
C207,209	" 47pF	"	2022-81
C214	" 68pF	"	2022-83
C221	" 100pF	"	160-04-9
C218,228,229, 230,231,232	" 10000pF	"	2022-68
C213	" 22000pF	"	2022-69

SPECIAL REPLACEMENT PARTS LIST (Continued)
PLL SYNTHESIZER

SYMBOL	DESCRIPTION	PART NUMBER
CAPACITORS (Continued)		
C220	Ceramic 47000pF	50V 2022-70
C203	Electro-lytic 1mfd	" 170-53-9
C202,227	" 10mfd	16V 170-23-9
C201	" 33mfd	" 170-48-9
C205,206	Tantalum 0.1pF	35V 2061-54
C225	Mica 22pF	50V 2061-58
C212,217,219	" 47pF	" 2061-56
C224	" 120pF	" 2061-57
C210,211	" 680pF	" 2061-55
C226	Mylar 1000pF	" 2061-59
TC201	Trimmer	2061-60



COURIER COMMUNICATIONS

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