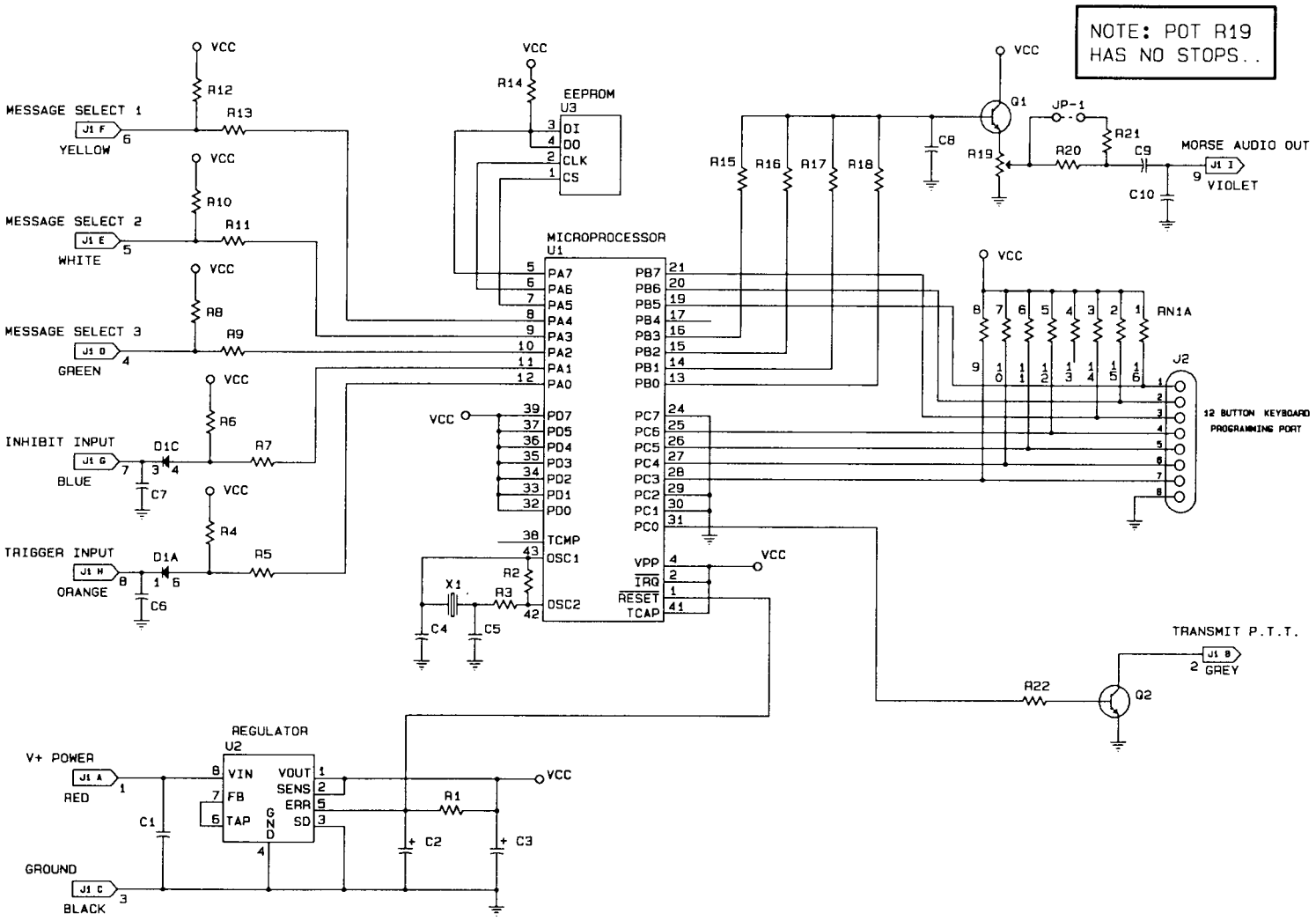
ID-8 INSTRUCTION SHEET



PARTS LIST

DESIG.	CSI NO.	DESCRIPTION	PRICE	DESIG.	CSI NO.	DESCRIPTION	PRICE
U1	51-6870	MC68HC705C8CFN CMOS Microprocessor, Programmed	43.41 ea	R4,R6, R8-R13	06-4736	47K, 5%, 0805, Chip Resistor	.10 ea
U2	48-2951	LP2951CM Low Dropout Regulator	2.85 ea	R17	06-6236	62K, 5%, 0805, Chip Resistor	.10 ea
U3	51-9356	XLS93C56JR CMOS EEPROM	3.78 ea	R18,R20	06-1246	120K, 5%, 0805, Chip Resistor	.10 ea
Q1	48-4401B	MMBT4401 NPN Si Transistor	.30 ea	R1,R5,R7	06-1646	160K, 5%, 0805, Chip Resistor	.10 ea
Q2	48-0056	BCX56 NPN Si SOT-89 Transistor	.80 ea	R2	06-2756	2.7Meg, 5%, 0805, Chip Resistor	.10 ea
D1	48-0010	INM10 Triple Diode Array	.43 ea	R19	18-5026	5K, 3MM, Chip Trimmer Pot	.82 ea
X1	48-3835	AT38-3.579 mHz Crystal	1.80 ea	RN1	51-1215	47K x 8 Chip Resistor Network	.75 ea
C2,C3	19-2226	2.2uf,16v,20% Tant.Chip Capacitor	.54 ea	J1	09-8717	9 Pin Sub-Miniature Header	.87 ea
C1,C9	22-1040	.1uf,X7R,50v,10% 1206 Mono.Cap.	.25 ea	J2	09-4608	8 Pin SIP Socket	.75 ea
C8	22-1030	.01uf,X7R,50v,10% 0805 Mono.Cap.	.25 ea	KY1	38-1007	12 Button Programming Keyboard	6.00 ea
C6,C7,C10	22-1510	150pf,NPO,50v,10%,0805 Mono.Cap.	.25 ea		01-1023	9 Pin Plug-In Cable Assembly	2.50 ea
C4,C5	22-2200	22pf,NPO,50v,10% 0805 Mono.Cap.	.25 ea		84-1061	ID-8 Printed Circuit Board	7.25 ea
R22	06-2226	2.2K, 5%, 0805, Chip Resistor	.10 ea		68-2087	ID-8 Instruction Sheet	.50 ea
R21	06-4726	4.7K, 5%, 0805, Chip Resistor	.10 ea		75-1002	Double Sided Tape Squares	.07 ea
R3,R14,R15	06-1536	15K, 5%, 0805, Chip Resistor	.10 ea		56-1001	CSI Tuning Tool	.20 ea
R16	06-3036	30K, 5%, 0805, Chip Resistor	.10 ea			4-40 Hardware Kit	.90 ea

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1.0 INTRODUCTION

The Communications Specialists Model ID-8 is an Automatic Morse Station Identifier that is designed to generate audio tone interrupted and continuous wave morse code as programmed by the user. The Product is designed to meet FCC requirements for use in commercial, public safety and amateur radio applications such as repeater identifiers, base station identifiers, beacons, CW memory keyers and other applications requiring the automatic or semiautomatic generation of morse code. The ID-8 can be configured for transmitting a message at the beginning or end of a transmission. In addition, a message can be initiated manually, or automatically at a timed interval. The Inhibit Input will hold-off a message until the channel is clear of traffic.

The ID-8 is totally field programmable by the user with an external keyboard. Factory ROM programming and other complex jumper configurations of the call sign and other features is no longer required. All programming information is permanently stored in a non-volatile **EEPROM**, that can be altered at any time.

The Product has been designed with the following field programmable features:

* Eight programmable messages
* Message length over 200 characters long
* CW speed programmable from 1 to 99 WPM
* ID interval timer programmable from 1 to 99 minutes
* ID hold-off timer programmable 0 to 99 seconds
* CW tone frequency programmable from 100Hz to 3000Hz
* Front porch delay interval programmable from 0 to 9.9 sec.
* ID with active high or active low signal
* Inhibit ID with active high or active low signal

Low power microprocessor CMOS circuitry has resulted in a product that is virtually immune to temperature variations and high RF fields that affect most other station identifiers.Because of its small size and low power consumption, innovative engineering has resulted in a low cost product that is ideal for automatic station identification. All this from Communications Specialists, the leader in tone signalling since 1967.

2.0 INSTALLATION INSTRUCTIONS

When installing the ID-8, be careful not to twist or bend the printed circuit board as this can damage the surface mount components. In addition, use static protection techniques while handling the unit. Be sure that power is removed from the equipment before installing the ID-8. The ID-8 should be installed using the hardware pack supplied with the unit. If you decide to program the ID-8 after installation, be sure that you have provided room in the installation so that the programming keyboard can be attached to J2. The following paragraphs describe each of the external connections on the ID-8:

+POWER (RED) J1-1

This wire should be connected directly to a filtered source of continuous positive DC voltage in the range of +6.0VDC to +20.0VDC. This connection should be made "downstream" from the power switch, and any power supply filter components in the radio set. If a regulated source of DC voltage is available, it may be used. Using a quiet and stable source of DC voltage inside the radio set will reduce the possibility of picking up power supply noise.

GROUND (BLACK) J1-3

The Ground wire should be connected to a location inside the radio set which will supply a DC power ground return to the ID-8. To eliminate ground loops and power supply noise, the ground return to the ID-8 should be connected to the same power supply ground used in the audio stage of your transmitter.

MORSE AUDIO OUTPUT (VIOLET) J1-9

This connection generates the morse audio tone for injection to the transmitter. Connect this wire to the audio input on the transmitter. If the ID-8 does not provide sufficient audio level for your transmitter, then place a solder jumper across JP-1 on the ID-8 printed circuit board. This will reduce the impedance of the Morse Audio Output, and supply additional drive. Be sure to use a low wattage soldering iron to prevent damage to the ID-8 printed circuit board.

TRIGGER INPUT (ORANGE) J1-8

The Trigger Input tells the ID-8 when a message should be transmitted. This line can be connected to the PTT, COR, or CTCSS circuit in your system depending on your application requirements. The Trigger Input can be programmed to trigger on an active low or active high signal. The switching threshold from active low to active high is at 1.4VDC. The ID-8 may be operated in the beacon, or continuous mode by permanently tying the Trigger Input to ground.

PTT OUTPUT (GREY) J1-2

The PTT Output line is an open collector transistor that pulls to ground to key the transmitter. The PTT Output will hold the transmitter on the air while a morse code message is transmitted. At the end of the transmission, the PTT Output will release the transmitter keying line. The PTT Output should be connected to the transmitter keying line. If the PTT Output is driving a relay, be sure that the relay has a protection diode across the relay coil to reduce inductive kickback that could damage the keying transistor, Q2.

MESSAGE SELECT 1 (YELLOW) J1-6
MESSAGE SELECT 2 (WHITE) J1-5
MESSAGE SELECT 3 (GREEN) J1-4

The ID-8 can generate up to eight different messages by the configuration of the Message Select lines. The connections to the Message Select lines may be changed at any time to select a different message. The following table shows how to connect the three Message Select wires for selecting a particular message number. The table also indicates the maximum number of characters that may be programmed in any message number location.

Message #	MS1	MS2	MS3	Message Length
1	NC	NC	NC	69
2	NC	NC	GND	21
3	NC	GND	NC	21
4	NC	GND	GND	21
5	GND	NC	NC	21
6	GND	NC	GND	21
7	GND	GND	NC	21
8	GND	GND	GND	21

NC: no connection or 5V GND: connect to ground

Since most station identifiers only send one call sign, only one message is required. In this case, use 'Message #1', since no connection is required to the three Message Select lines. The three wires may be cut from the connector, or coiled up and taped.

Please note that a very long message, up to 216 characters, may be programmed into Message #1. The 216 characters is equal to the length of all eight message numbers added up. Since each message is programmed in successive order in the EEPROM memory, message numbers can be 'strung' together to form longer messages. For example, Message #3, #4 and #5 could be strung together to form a 63 character message.

INHIBIT INPUT (BLUE) J1-7

The Inhibit Input is used to prevent the transmission of a station ID from interfering with voice traffic, or interfering with a co-channel user. When active, the Inhibit Input will delay or hold-off the generation of the station ID until the input is clear. This line can be connected to the PTT, COR, or CTCSS circuit in your system depending on your application requirements. Thus, when no PTT, COR or CTCSS activity is detected, the ID-8 will proceed to transmit the message. The Inhibit Input can be programmed to operate on an active low or active high signal. The switching threshold from active low to active high is at 1.4VDC. Often, the Trigger Input and Inhibit Input lines are connected together.

2.1 ADJUSTMENTS

The Morse Audio Level Adjustment, R19, is the only adjustment required on the ID-8. This control sets the level of the Morse Audio Output. A very small slotted alignment tool should be used to make the adjustment on the ID-8 PCB when a message is being generated. Set this level adjustment to the correct modulation or level setting required for your particular application. **PLEASE NOTE THAT R19 HAS NO STOPS.**

3.0 PROGRAMMING THE ID-8

This section of the instructions describes how to program the ID-8 to suit the needs of your radio system. These programming features are designed to be programmed at any time by the user. All programming information is retained in a non-volatile EEPROM. The ID-8 may be programmed before or after it is installed in the associated radio set. The ID-8 is programmed with the 12 button keyboard that is supplied with the ID-8. When programming the unit, be careful not to damage the ID-8 printed circuit board.

To access the ID-8 Programming Mode, use the following procedure:

1. Place one finger underneath J2 on the ID-8 printed circuit board, and carefully insert the pins of the 12 button programming keyboard into J2 such that the main body of the keyboard **COVERS** the printed circuit board.

2. Now press and hold down the '#' key on the programming keyboard, and apply power to the ID-8. Upon release of the key, after power up, the ID-8 will be in the Programming Mode. The ID-8 will generate a 'beep' tone on the Morse Audio Output upon entering the Programming Mode. A beep tone will also be generated after a successful completion of any programming sequence. A triple beep will be generated if an error is detected in any programming sequence. Being able to monitor the audio on the Morse Audio Output will aid in programming the ID-8.

The following summary table lists the programmable features, the keyboard sequence for programming the features, and the default data stored in the Model ID-8 EEPROM when received from the factory. Only those features that you wish to change need to be programmed. The default data in the ID-8 EEPROM is set for the most common configuration. Each feature is programmed by entering a two digit programming code followed by the '#' key, and then followed by any data that is necessary to program that feature.

PROGRAMMABLE OPTIONS SUMMARY TABLE

FEATURE	PROGRAMMING SEQUENCE	DEFAULT
Set ID Message 1	01# message data #	'1'
Set ID Message 2	02# message data #	'2'
Set ID Message 3	03# message data #	'3'
Set ID Message 4	04# message data #	'4'
Set ID Message 5	05# message data #	'5'
Set ID Message 6	06# message data #	'6'
Set ID Message 7	07# message data #	'7'
Set ID Message 8	08# message data #	'8'
ID on manual trigger only	10#	
ID automatically at the programmed interval	11#	default
Set ID interval timer 0-99 minutes	12# XX#	15 min
Set ID hold-off timer 0-99 seconds	13# XX#	3 sec
Trigger on active low signal	14#	default
Trigger on active high signal	15#	
Inhibit on active low signal	16#	default
Inhibit on active high signal	17#	
Front porch delay 0-9.9 seconds	18# XX#	200 ms
Code speed 1-99 WPM	19# XX#	20 WPM
CW audio tone frequency 100-3000 Hz.	20# XXXX#	1200 Hz.
Audio modulation mode	21#	default
Carrier wave mode	22#	
Disable Courtesy tone	23#	default
Enable Courtesy tone	24#	
Play Message 1	31#	
Play Message 2	32#	
Play Message 3	33#	
Play Message 4	34#	
Play Message 5	35#	
Play Message 6	36#	
Play Message 7	37#	
Play Message 8	38#	
Re-initialize EEPROM to factory default values	39#	

3.1 PROGRAMMING FEATURE DESCRIPTIONS

This section describes all of the programming features of the ID-8 as shown in the Programmable Options Summary Table. Each feature is described in detail. After a feature has been programmed, additional features may then be programmed. When you have completed programming the ID-8, remove power from the unit, and then remove the programming keyboard. Or to exit the Programming Mode and return to normal operation, press the **'STAR'** key at any time.

SET ID MESSAGE 1-8

This feature allows the user to program a morse code message in any of the eight possible memory locations. The default message data in each memory location is the number that corresponds to that message location. To program a message in a message location, first press the two digit programming code (01-08) for the selected message location, followed by the '#' key. Then proceed to program in the morse code message by using the Morse Code Table.

Note that each alphanumeric character, and other special characters correspond to a two digit number in the Morse Code Table.
After each two digit number is entered for a character, press the '#' key, and then proceed to enter the next character in the message. After the last character number is entered, press the '#' key twice to terminate the message entry. If you can monitor the Morse Audio Output, a single beep tone will be heard indicating proper programming. If a mistake is made in programming, press the '#' key twice and start over. Please note the maximum length of a message for each message location as per the table in the Installation section.

MORSE CODE TABLE

0 - 00	C - 12	O - 24	/ - 36
1 - 01	D - 13	P - 25	. - 37
2 - 02	E - 14	Q - 26	, - 38
3 - 03	F - 15	R - 27	? - 39
4 - 04	G - 16	S - 28	AR - 40
5 - 05	H - 17	T - 29	AS - 41
6 - 06	I - 18	U - 30	BK - 42
7 - 07	J - 19	V - 31	BT - 43
8 - 08	K - 20	W - 32	KN - 44
9 - 09	L - 21	X - 33	SK - 45
A - 10	M - 22	Y - 34	SPACE - 46
B - 11	N - 23	Z - 35	

For example, to program in the morse code message 'DE N6XB/R' in message location number 1, enter the following programming sequence: '01# 13# 14# 46# 23# 06# 33# 11# 36# 27# #'

ID ON MANUAL TRIGGER ONLY

This feature is designed to program the ID-8 to transmit a programmed message every time the Trigger Input is activated. The interval timer is not used in this mode. Use this feature if you wish to transmit a message each time the Trigger Input is activated. Enter the programming code '10#' to activate this feature.

ID AT THE PROGRAMMED INTERVAL

This feature is designed to program the ID-8 to transmit a programmed message at a regular interval whenever the transmitter is active. No message will be transmitted during intervals when the transmitter is off for a period that exceeds the duration of the interval timer. A message will be transmitted when the transmitter is keyed up if the interval timer has expired. After a message is transmitted, the interval timer will reload with the programmed interval time. This is the most common configuration for repeater use. Enter the programming code '11#' to activate this feature.

SET ID INTERVAL TIMER

This feature allows the user to set the time duration of the interval timer. The interval timer determines the time period between successive message transmissions. The interval timer is programmable in steps of 1 minute from 0 to 99 minutes. Most systems require a station ID to be sent every 10, 15, or 30 minutes depending on the class of service. To program the interval timer, enter the programming code '12' followed by the '#' key. Then enter a number from 0 to 99 which is the time interval, in minutes. Follow this number by the '#' key. Please note that an interval time of '0' minutes will result in the continuous cycling of the message.

SET ID HOLD-OFF TIMER

The hold-off timer is designed to hold-off or delay the transmission of a message for a period ranging from 0 to 99 seconds. If the Inhibit Input is used, the hold-off delay is the time duration from when the Inhibit Input is clear, to when the transmission of the message begins. If the Inhibit Input is not used or is not active when it is time to transmit a message, the hold-off delay is the time duration from when it is time to send a message, to when the transmission of the message begins. To program the hold-off timer, enter the programming code '13' followed by the '#' key. Then enter a number from 0 to 99 which is the hold-off time interval, in seconds. Follow this number by the '#' key.

TRIGGER ON ACTIVE LOW SIGNAL / TRIGGER ON ACTIVE HIGH SIGNAL

The ID-8 can be programmed to begin a message transmission by detecting an active low (pull to ground), or active high (pull to supply) signal. Using a scope, or voltmeter, determine the polarity of your trigger signal and program the ID-8 accordingly. To program the ID-8 for your application, enter the programming code '14' for trigger on active low signal, or '15' for trigger on active high signal. Follow the two digit programming code with the '#' key.

INHIBIT ON ACTIVE LOW SIGNAL/INHIBIT ON ACTIVE HIGH SIGNAL

The ID-8 can be programmed to inhibit a message transmission by detecting an active low (pull to ground), or active high (pull to supply) signal. To program the ID-8 for your application, enter the programming code '16' to inhibit on active low signal, or '17' to inhibit on active high signal. Follow the two digit programming code with the '#' key.

FRONT PORCH DELAY

The front porch delay is the time period between when the ID-8 keys the transmitter and the morse code generation begins. This period is required since it can take a few hundred milliseconds for a transmitter to come up to full output power. Thus, the transmission of the message will begin only after the transmitter is ready to pass audio. The default value should be sufficient for most applications, but for special requirements, enter the programming code '18' followed by the '#' key, and then a two digit number that corresponds to the delay, in 100 millisecond increments. Follow this number by the '#' key. For example, for a 500 millisecond front porch delay, enter the programming sequence: '18# 05#'

CODE SPEED

This feature sets the morse code speed in words per minute (WPM). To change the code speed, enter the programming code '19' followed by the '#' key, and then a two digit number that is the code speed required. Follow this number with the '#' key.

CW AUDIO TONE FREQUENCY

This feature sets the audio tone frequency used for generating the morse code. If the default value of 1200 Hz. will not work for your application, the audio tone can be changed by entering the programming code '20' followed by the '#' key, and then enter the tone frequency desired in the range of 100 Hz. to 3000 Hz. Follow the tone frequency entry by the '#' key.

AUDIO MODULATION MODE / CARRIER WAVE MODE

The audio modulation mode is used for most FM, PM and sideband applications. In this mode the PTT Output line will key the transmitter, while the Morse Audio Output generates the audio modulation for transmission. In the carrier wave mode, the PTT Output transmits the morse code by keying the transmitter on and off at the morse code rate. In addition, the Morse Audio Output also generates the morse code, but is typically used only as a sidetone. The carrier wave mode is normally used where a CW carrier must be keyed on and off for transmission of a message. An HF amateur radio station can use this mode for transmitting CW messages similar to a memory keyer. Additional applications include RTTY and FAX radio transmitters. To program the audio modulation mode, or the carrier wave mode, enter the programming code '21' or '22' respectively, followed by the '#' key.

DISABLE/ENABLE COURTESY TONE

The courtesy tone is used in repeater applications and consists of a 50 millisecond beep tone that is generated by the ID-8 at the end of an input signal transmission. This provides an audible indication, instead of the squelch tail, as to when a station on the input channel unkeys his transmitter. The courtesy tone begins as soon as the Trigger Input is released from an 'active' condition. The courtesy tone is inhibited during the hold-off time, and during a morse message transmission. The courtesy tone is only operational in the automatic mode. The courtesy tone can be disabled or enabled by using the programming codes '23' or '24' followed by the '#' key.

PLAY MESSAGE 1-8

The programming codes '31' through '38' are designed to allow you to test any one of the eight possible messages programmed in the ID-8. To test a message in any message number location, press the two digit programming code, corresponding to the message you wish to play, followed by the '#' key. The ID-8 will then key the PTT Output line, and play the morse code message in that message location. After the message has been generated, the ID-8 will unkey the transmitter.

RE-INITIALIZE EEPROM

The programming code '39#' can be used to re-initialize the ID-8 EEPROM, and return the unit to the factory default values.

3.2 PROGRAMMING EXAMPLE

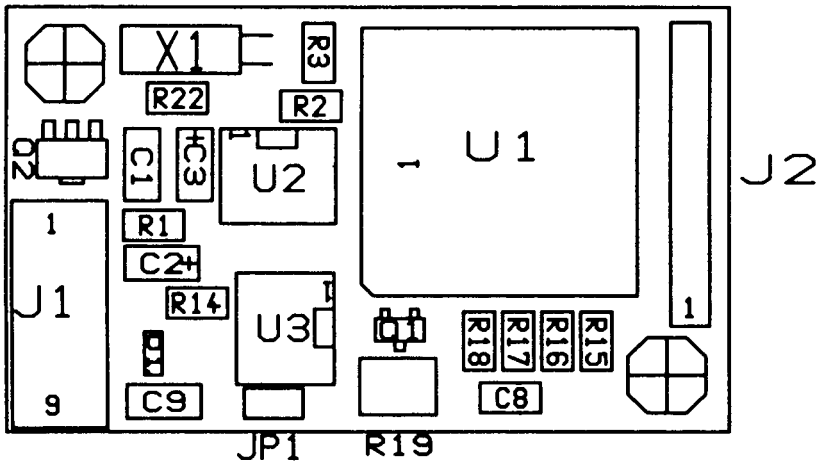
An ID-8 is to be installed in a 450 Mhz. repeater. A station identification message is to be sent every 10 minutes whenever the repeater transmitter is active. The station identification message is: 'DE KAB772', and is to be stored in Message #1. The ID is triggered off of the COR line which provides 8 volts when a signal is present on the input to the repeater. In addition, the message is to be sent at 22 WPM at a tone frequency of 1000 Hz. All other parameters use the ID-8 default values. This information is programmed into the ID-8 by first entering the Programming Mode as described in the previous section, and then entering the following digit sequence:

```
01# 13# 14# 46# 20# 10# 11# 07# 07# 02# #
12# 10#
15#
19# 22#
20# 1000#
```

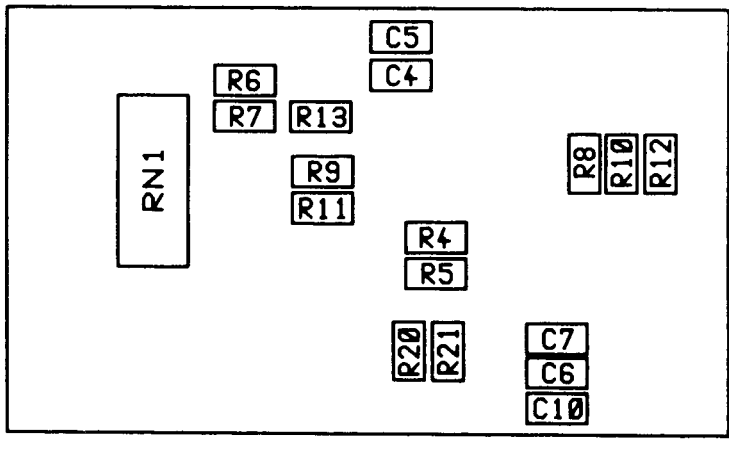
4.0 SPECIFICATIONS

Number of messages	8 selectable
Message length	216 characters maximum
Field Programming	by external 12 button keyboard
CW speed	programmable from 1 to 99 WPM
ID interval timer	programmable from 0 to 99 minutes
CW tone frequency	programmable from 100Hz to 3000Hz
Front porch delay	programmable from 0 to 9.9 seconds
ID hold-off timer	programmable 0 to 99 seconds
Drift and Stability	quartz crystal controlled
Morse Output Z	4.7 K ohms AC coupled
Morse Output Level	Adjustable from 0V to 4.0V
TX PTT Output	Open collector transistor 80VDC @300ma
Temperature Range	-30^0C to $+65^0$C
Supply Requirements	6.0 to 20.0 VDC unregulated
Current Requirement	6 ma. typical
Size	1.85" X 1.12" X 0.35"

TOP SIDE PARTS LAYOUT



BOTTOM SIDE PARTS LAYOUT



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