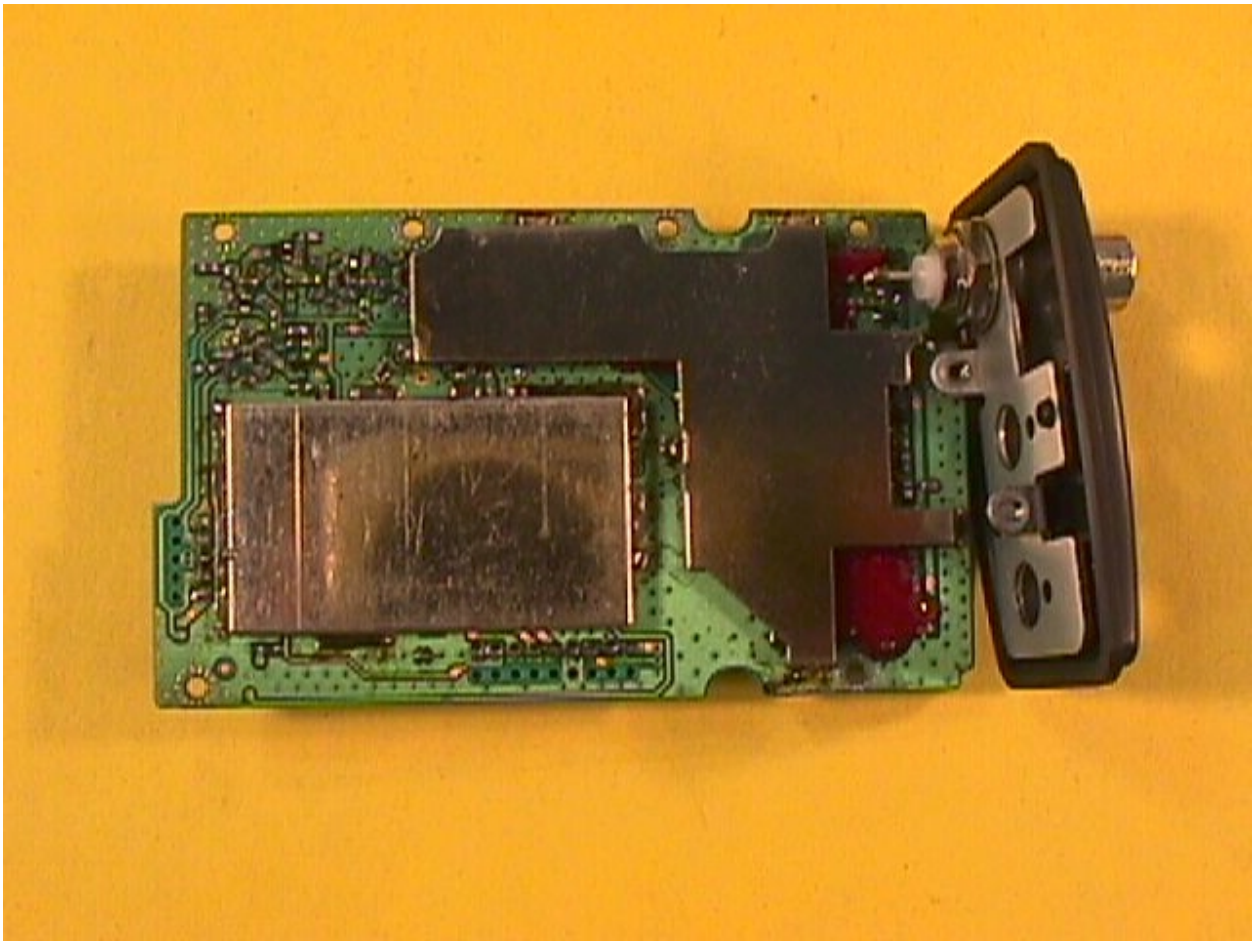
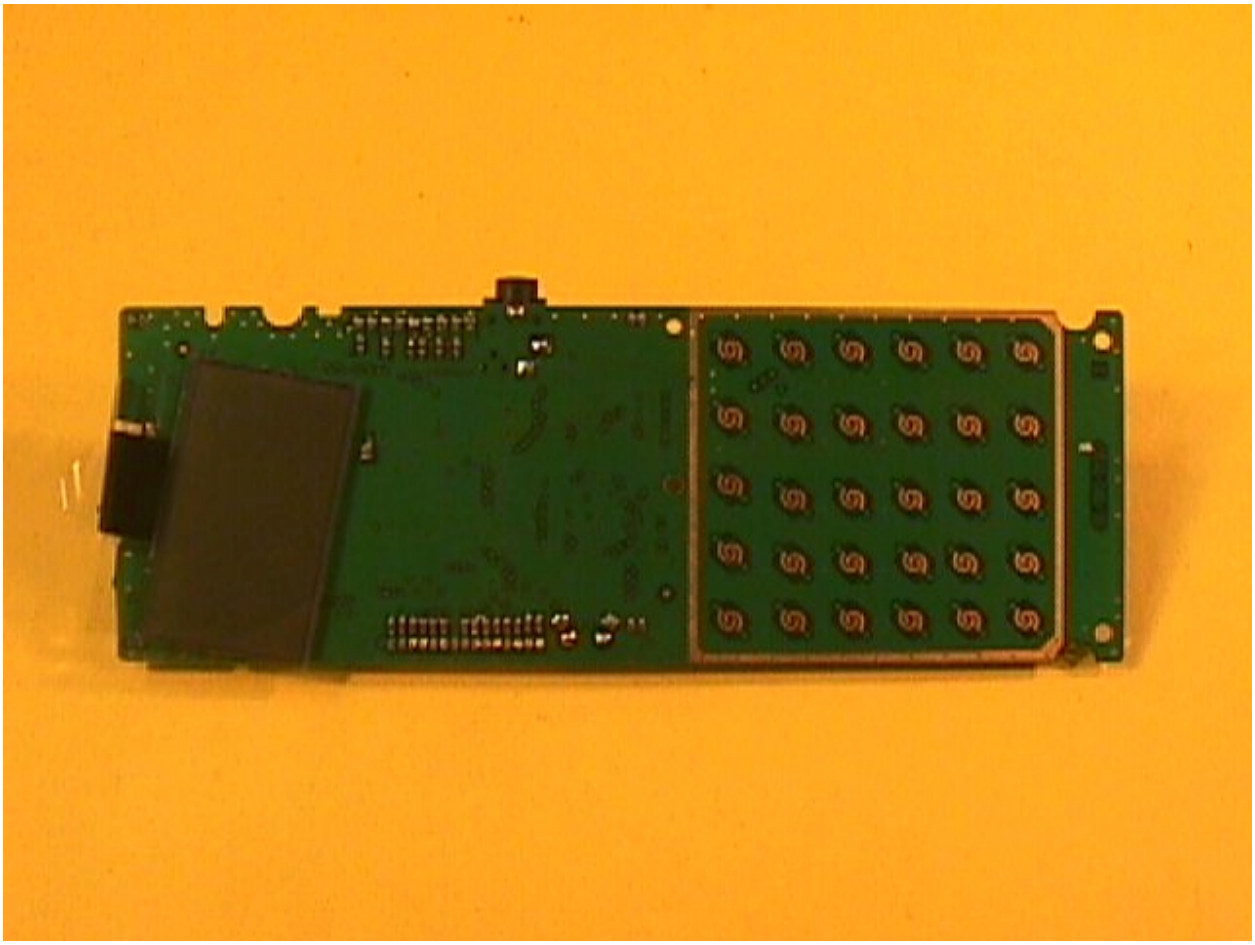
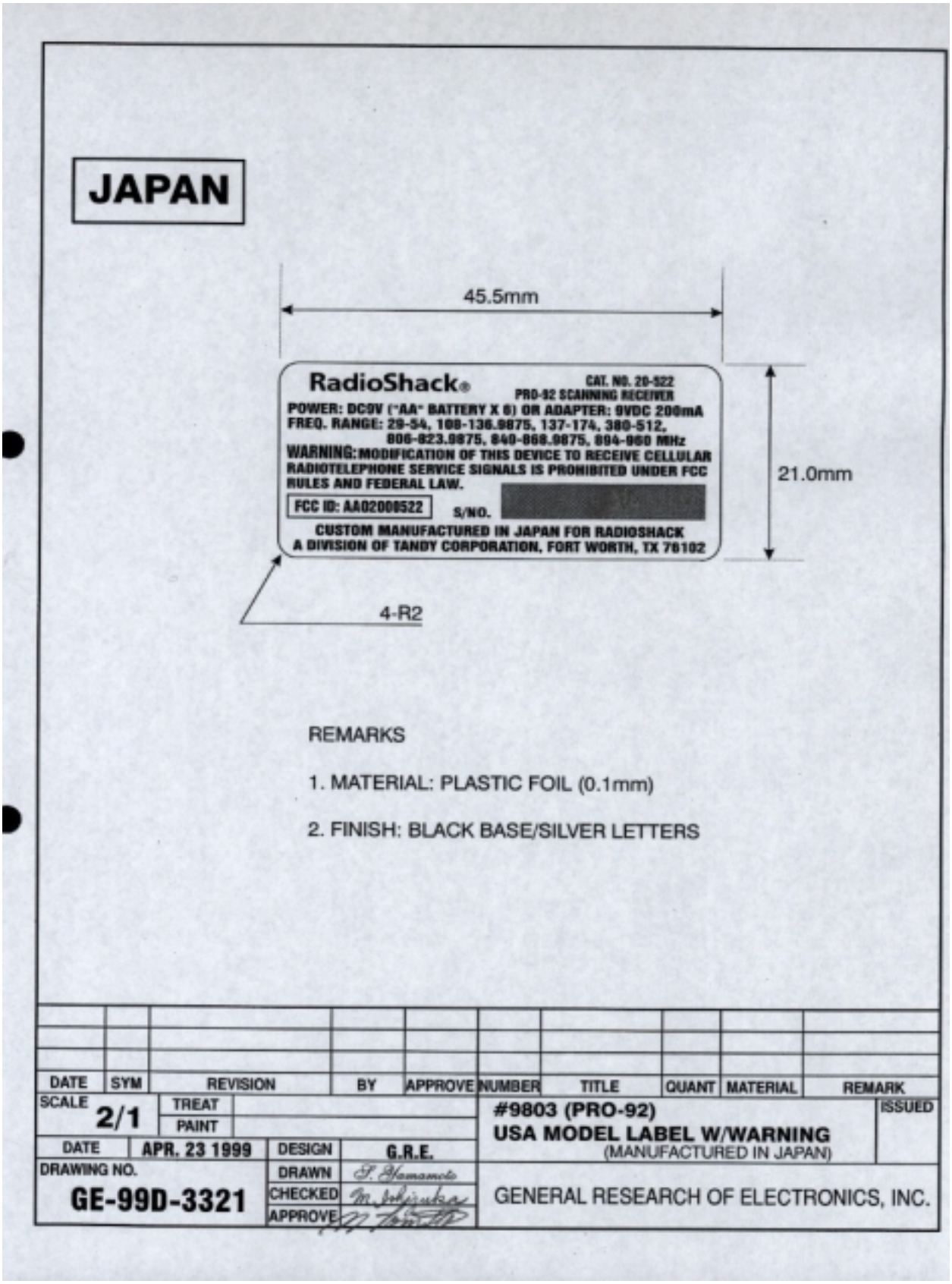




6.0 **Product Labeling**

6.1 Label Artwork

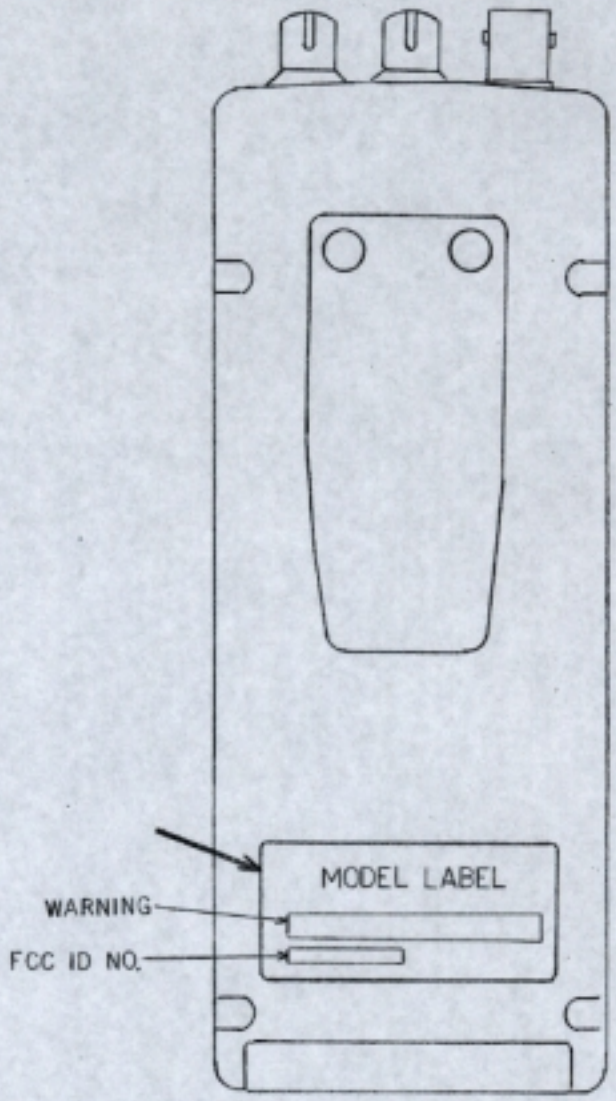
An engineering drawing of the label that will be permanently affixed to the unit is attached. This label will be attached to the unit at the location shown in Section 6.2.


JAPAN
45.5mm
RadioShack®
CAT. NO. 20-522
PRO-92 SCANNING RECEIVER
POWER: DC9V ("AA" BATTERY X 6) OR ADAPTER: 9VDC 200mA
FREQ. RANGE: 29-54, 108-136.9875, 137-174, 380-512,
806-823.9875, 840-868.9875, 894-960 MHz
WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.
FCC ID: AAD2000522
S/NO.
CUSTOM MANUFACTURED IN JAPAN FOR RADIOSHACK
A DIVISION OF TANDY CORPORATION, FORT WORTH, TX 76102
21.0mm
4-R2
REMARKS
1. MATERIAL: PLASTIC FOIL (0.1mm)
2. FINISH: BLACK BASE/SILVER LETTERS
DATE SYM REVISION BY APPROVE
NUMBER TITLE QUANT MATERIAL REMARK
SCALE 2/1
TREAT
PAINT
#9803 (PRO-92)
USA MODEL LABEL W/WARNING
(MANUFACTURED IN JAPAN)
ISSUED
DATE APR. 23 1999
DESIGN G.R.E.
DRAWING NO. GE-99D-3321
DRAWN
CHECKED
APPROVE
GENERAL RESEARCH OF ELECTRONICS, INC.

6.2 Label Location

See attached page.

FCC ID Label Location (FCC ID: AAO2000522)



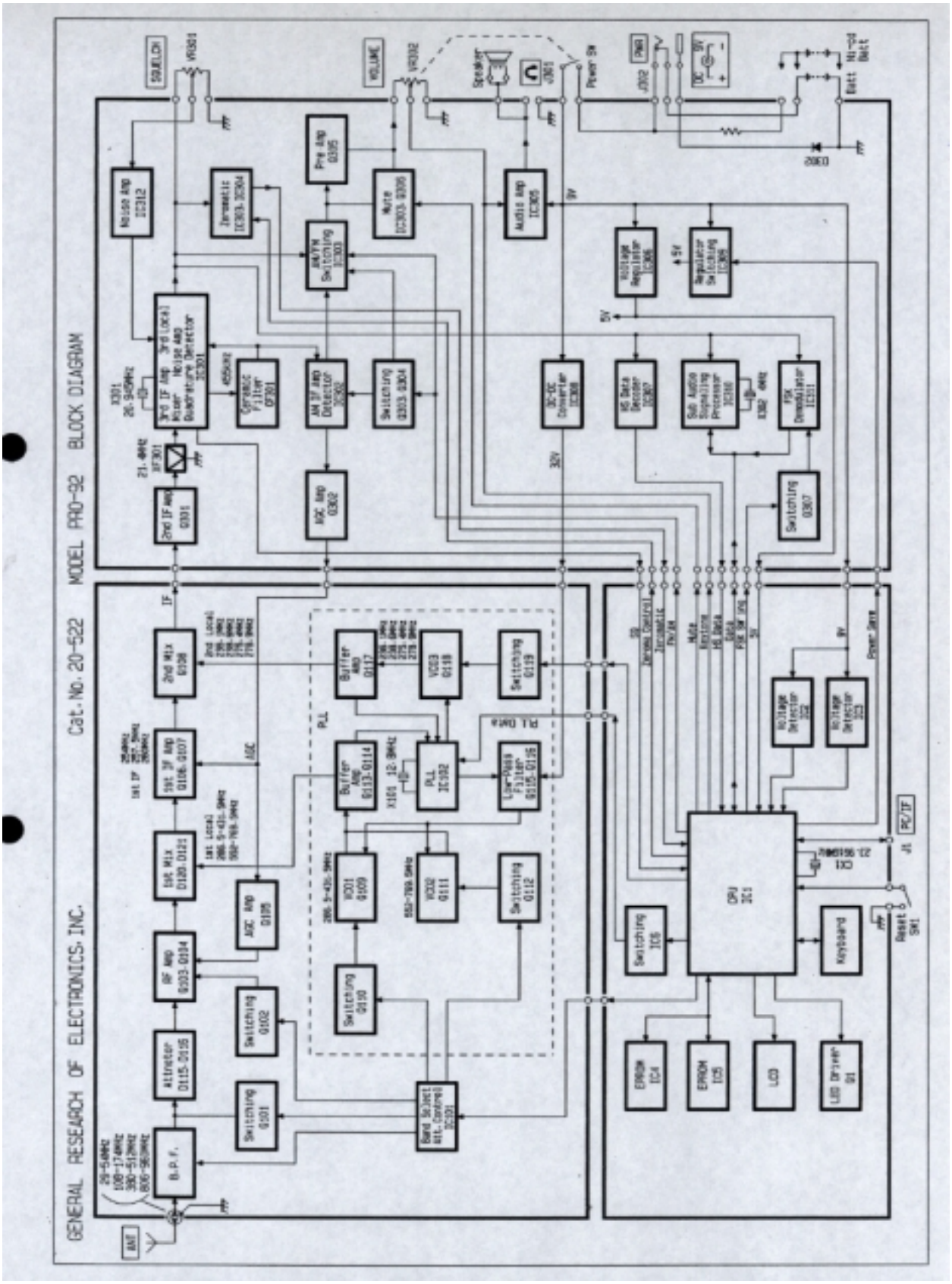
The §15.19(a)(3) statement is indicated in the user's instruction manual.

GENERAL RESEARCH OF ELECTRONICS, INC.

7.0 **Technical Specifications**

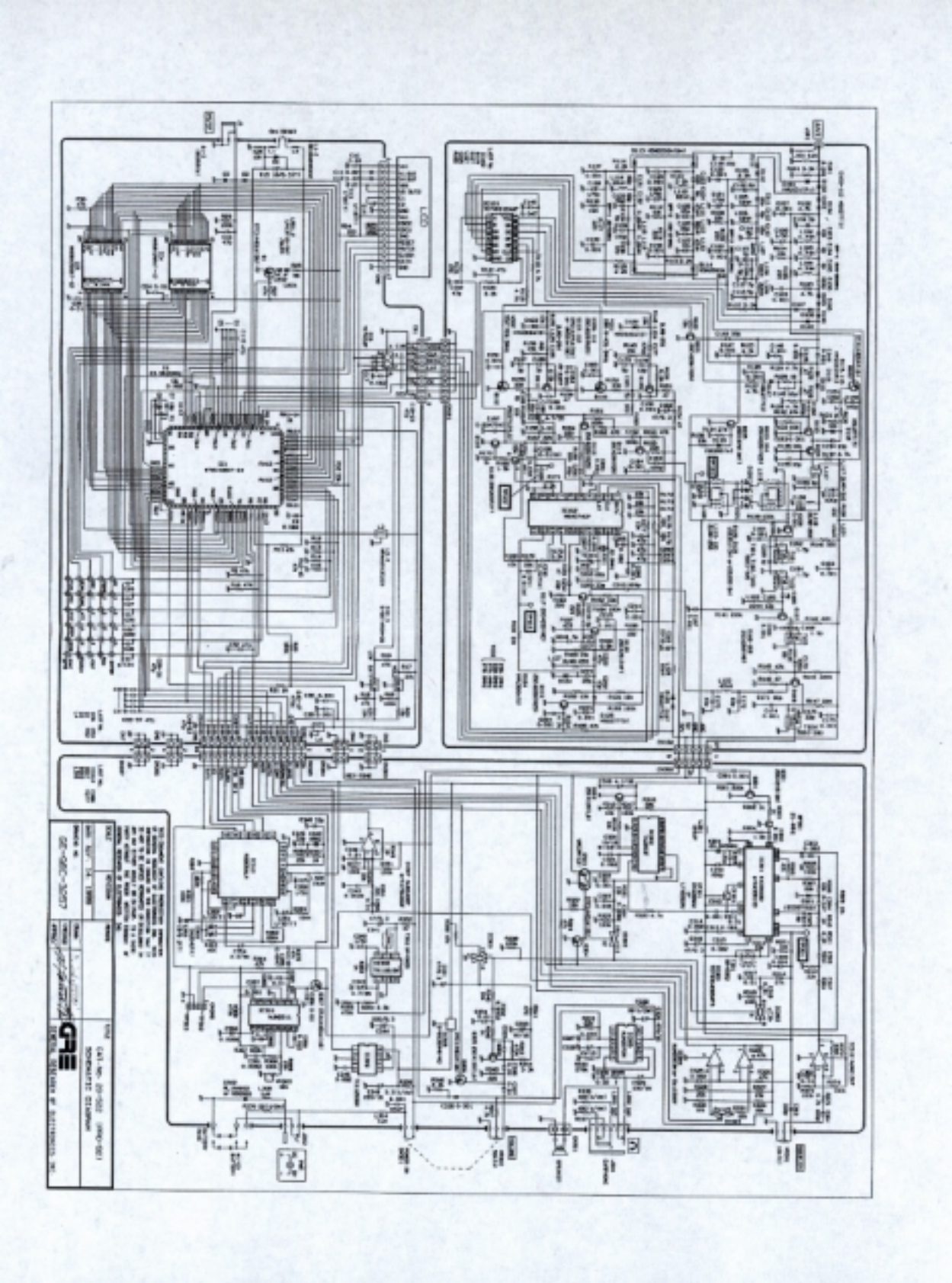
7.1 Receiver Block Diagram

See attached page.


GENERAL RESEARCH OF ELECTRONICS, INC.
Cat. No. 20-522 MODEL PRO-92 BLOCK DIAGRAM

7.2 Receiver Circuit Diagram

See attached page.



GENERAL RESEARCH OF ELECTRONICS, INC.

MODEL No. 20-522

FUNCTION OF EACH SEMICONDUCTOR OR OTHER ACTIVE CIRCUIT DEVICE [2.983(6)]

1. Transistor, FET

Q1	DTC144EUA	LED DRIVER
Q101	2SC4226	SWITCHING
Q102	DTA144EUA	SWITCHING
Q103	2SC4226	RF AMP
Q104	2SC4226	RF AMP
Q105	2SD1979	AGC AMP
Q106	2SC4250	1st IF AMP
Q107	2SC4250	1st IF AMP
Q108	2SC4250	2nd MIXER
Q109	2SC4226	VCO 1
Q110	DTC114YUA	SWITCHING
Q111	2SC4226	VCO 2
Q112	DTC114YUA	SWITCHING
Q113	2SC4226	BUFFER VCO 1&2
Q114	2SC4226	BUFFER VCO 1&2
Q115	2SC2712	LOW PASS FILTER
Q116	2SK209	LOW PASS FILTER
Q117	2SC4250	BUFFER VCO 3
Q118	2SC4251	VCO 3
Q119	2SC4226	SWITCHING
Q301	2SC4215	2nd IF AMP
Q302	2SC4116	AGC AMP
Q303	UMC2N or UMC2	SWITCHING
Q304	DTC144EUA	SWITCHING
Q305	2SC4116	PRE AMP AF
Q306	DTC144EUA	SWITCHING
Q307	DTA144EUA	SWITCHING

GENERAL RESEARCH OF ELECTRONICS, INC.

MODEL No. 20-522

FUNCTION OF EACH SEMICONDUCTOR OR OTHER ACTIVE CIRCUIT DEVICE [2.983(6)]

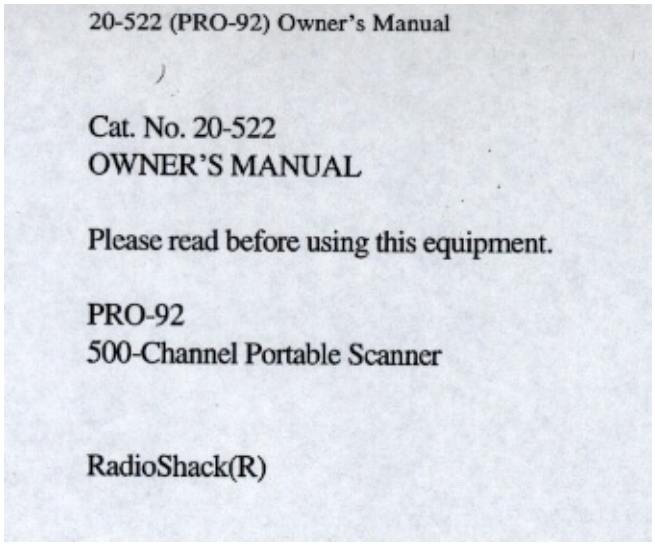
2. IC

IC1	W78C438CF-24	CPU
IC2	S-80745SN-D9	VOLTAGE DETECTOR
IC3	S-80745SN-D9	VOLTAGE DETECTOR
IC4	HN58V256AT-12	MEMORY
IC5	HN58V256AT-12	MEMORY
IC6	TC7W32F	SWITCHING
IC101	TC74HC164AF	BAND SELECT/ATT. CONT./VCO CONT.
IC102	M64074GP	PLL
IC301	KA3361BD or KA3361CD	3rd IF AMP, 3rd LO, 3rd MIX, NOISE AMP, QUADRATURE DETECTOR
IC302	TA2003F	AM
IC303	TC74HC4066AFT or TC74HC4066AFS	SWITCHING
IC304	NJM2903M or BA10393F	ZEROMATIC
IC305	NJM2070D	AUDIO AMP
IC306	S-81350HG-KD	VOLTAGE REGULATOR
IC307	NJM2406F or TA75S393F	HS DATA DECODER
IC308	TK11819M	DC TO DC CONVERTOR
IC309	TK11250BMCL	VOLTAGE REGULATOR
IC310	MX805ALH	SUB-AUDIO SIGNALING PROCESSOR
IC311	NJM2211M	FSK DEMODULATOR
IC312	NJM2130F	NOISE AMP

8.0 **Instruction Manual**

Attached is a preliminary copy of the Instruction Manual.

This manual will be provided to the end-user with each unit sold/leased in the United States.



20-522 (PRO-92) Owner's Manual

Cat. No. 20-522
OWNER'S MANUAL

Please read before using this equipment.

PRO-92
500-Channel Portable Scanner

RadioShack(R)

20-522 (PRO-92) Owner's Manual

FEATURES

Your RadioShack PRO-92 500-Channel Portable Scanner lets you in on all the action! This scanner gives you direct access to over 33,000 frequencies including those used by police and fire departments, ambulance services, government agencies, air, and amateur radio services.

Your scanner includes these special features:

Hyperscan TM and Hypersearch TM – let you set the scanner to scan at up to 25 channels per second and search at up to 50 steps per second, to help you quickly find interesting transmissions.

Trunking Mode – tracks three trunking systems, LTR, Motorola and EDACS.

Private Line Receiving – scans when CTCSS tone signal is received.

Digital Private Line Receiving – scans when receive Digital Private code.

12-Character, 4-Line Dot Matrix Display – shows you detailed operating information and lets you easlily program the scanner.

Text Input – lets you input the text on each channel, limit bank, or other memory so you can easy know about the frequency.

Ten Channel-Storage Banks – let you store 50 channels in each bank to group channels so calls are easier to identify.

Triple Conversion Superheterodyne Receiver – virtually eliminates any interference from intermediate frequency (IF) images, so you hear only the frequency you select.

Ten Preprogrammed Frequency Ranges – let you search for transmissions within preset frequency ranges or within ranges you set, to reduce search time and select interesting frequencies more quickly.

Scan Delay – delays scanning for about 2 seconds before moving to another channel in conventional mode, so you can hear more replies that are made on the same channel.

Priority Channel – you can set the scanner to check one channel every 2 seconds so you do not miss important calls.

ATT (Attenuate) Button – reduces the scanner's sensitivity to strong local signals, to reduce interference or noise caused by these signals.

Weather Alert – automatically sounds the alarm tone to advise of hazardous weather conditions when it detects the alert signal on the local NOAA weather channel.

Weather SAME – automatically sounds the alarm tone to advice of the hazardous weather condition and indicate the event of the weather condition on the LCD when it detects the alert signal.

Page 2

Lock-Out Function – lets you set your scanner to skip over specified channels or frequencies when scanning or searching, and skip over IDs when tracking trunked systems.

Key Lock – lets you lock the scanner's keys to help prevent accidentally changing the scanner's programming.

Flexible Antenna with BNC Connector – provides excellent reception and is designed to help prevent antenna breakage.

Memory Backup – keeps the frequencies stored in memory for an extended time even without battery.

Three Power Options – let you power the scanner from internal batteries (non-rechargeable batteries, rechargeable batteries or a rechargeable scanner battery pack) or external AC or DC power (using an optional adapter).

Data Cloning – lets you transfer the programmed data to another PRO-92 scanner. You can also upload and/or download the programmed data to or from your PC using an optional interface kit.

We recommend you record your scanner's serial number here. This number is on the scanner's back panel.

Serial Number: _____

Your PRO-92 scanner can receive all of these frequencies:

29-54 MHz
108-136.9875 MHz
137-174 MHz
380-512 MHz
806-823.9875 MHz
849-868.9875 MHz
894-960 MHz

This Owner's Manual also includes the section "A General Guide To Scanning" to help you target frequency ranges in your service area so you can search for a wide variety of transmissions.

FCC NOTICE

Your scanner might cause TV or radio interference even when it is operating properly. To determine whether your scanner is causing the interference, turn off your scanner. If the interference goes away, your scanner is causing the interference. Try the following methods to eliminate the interference.

. Move your scanner away from the TV or radio.
. Connect your scanner to an outlet that is on a different electrical circuit from the TV or radio.
. Contact your local RadioShack store for help.

If you cannot eliminate the interference, the FCC requires that you stop using your scanner.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device must not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

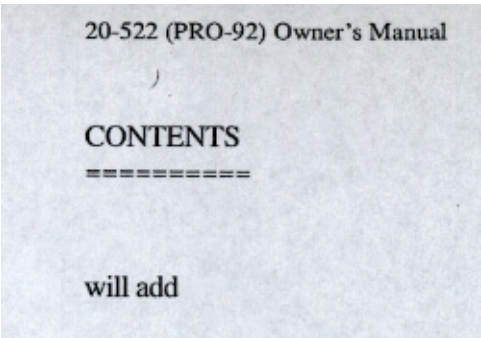
Note: Mobile use of this scanner is unlawful or requires a permit in some areas. Check the laws in your area.

Scanning Legally

Scanning is a fun and interesting hobby. You can hear police and fire departments, ambulance services, government agencies, private companies, amateur radio services, aircraft, and military operations. It is legal to listen to almost every transmission your scanner can receive. However, there are some electronic and wire communications that is illegal to intentionally intercept. These include:

. telephone conversations (cellular, cordless, or other private means of telephone signal transmission)
. pager transmissions
. scrambled or encrypted transmissions

According to the Federal Electronic Communications Privacy Act (ECPA), as amended, you could be fined and possibly imprisoned for intentionally listening to, using, or disclosing the contents of a party to the communication (unless such activity is otherwise illegal). These laws change from time to time might be state or local laws that also affect legal scanner usage.



20-522 (PRO-92) Owner's Manual

CONTENTS
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will add

PREPARATION

POWER SOURCES

You can power your scanner from any of three sources:
. internal batteries or a rechargeable scanner battery pack (not supplied – see "Using Batteries")
. standard AC power with optional AC adapter – see "Using Standard AC Power" on page 7)
. vehicle battery power (with an optional DC adapter – see "Using Vehicle Battery Power" on page 8)

Notes:
. Connecting an AC or DC adapter to the scanner disconnects internal batteries when you use the supplied non-rechargeable black battery holder, but it does not disconnect internal batteries when you use the supplied yellow rechargeable battery holder or a rechargeable battery pack.
. If you install the rechargeable battery holder or a rechargeable battery pack, you can operate the scanner and recharge the rechargeable batteries or the battery pack at the same time. See "Using Batteries" and "Charging Rechargeable Batteries or a Rechargeable Battery pack" on page 9.
. If the scanner stops working properly after connecting it to power, try resetting it. See "Resetting/Initializing the Scanner" on page 47.

Using Batteries

You can power the PRO-92 with six AA batteries. For the longest operation and best performance, we recommend alkaline batteries, available at your local RadioShack store.

You can use either the supplied non-rechargeable black battery holder, or the supplied rechargeable yellow battery holder. If using the rechargeable battery holder, we recommend nickel-cadmium batteries, such as RadioShack Cat. No. 23-125. You can also power the scanner from a rechargeable scanner battery pack, such as Cat. No. 23-288.

Warning: Never install non-rechargeable batteries in the yellow rechargeable battery holder. Non-rechargeable batteries can get hot or explode if you try to recharge them.

Note: You must charge rechargeable batteries or a rechargeable battery pack before using either the first time. See "Charging Rechargeable Batteries or a Rechargeable Battery Pack" on page 9.

Follow these steps to install batteries or a battery pack.

1. Press down on the battery compartment cover on the bottom of the scanner and slide the cover in the direction of the arrow to remove it.

add illustration.

2. Pull up and slide the battery holder or battery pack out of the battery compartment.

add illustration.

3. If you are installing individual batteries, insert six AA batteries in the battery holder as indicated by the polarity symbols (+ and -) marked on the holder.

add illustration.

Cautions:
. Use only fresh batteries of the required size and recommended type.
. Always remove old or weak batteries. Batteries can leak chemicals that destroy electronic circuits.
. Do not mix old and new batteries, different types of batteries (alkaline or rechargeable), or rechargeable batteries of different capacities.

4. Slide the battery holder or battery pack into the compartment.

add illustration.

Caution: The battery holder or battery pack fits only one way. Do not force it.

5. Replace the cover.

When battery power is low, Low Batteries! appears and the scanner beeps continuously. When battery power is exhausted, the scanner turns itself off. Replace all six non-rechargeable batteries, or recharge the rechargeable batteries or the battery pack. See "Charging Rechargeable Batteries or a Rechargeable Battery Pack" on page 9.

Caution: Always dispose of old batteries promptly and properly. Do not bury or burn them.

Using Standard AC Power

You can power the scanner from an AC outlet, using an AC adapter with a size H Adaptaplug (not supplied).

Warning: Do not use an AC adapter's polarized plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.

Cautions:
. You must use an AC adapter that supplies 9 volts and delivers at least 300 milliamps. Its center tip must be set to negative, and its plug must correctly fit the scanner's PWR DC 9V jack. The recommended adapter meets these specifications. Using an adapter that does not meet these specifications could damage the scanner or the adapter.
. When you finish using the AC adapter, disconnect it from the AC outlet first, then disconnect it from the scanner.

Plug the adapter's barrel plug into the scanner's PWR DC 9V jack. Then plug the adapter's power module into a standard AC outlet.

add illustration.

Using Vehicle Battery Power

You can power the scanner from a vehicle's battery using a DC adapter with a size H Adaptaplug (not supplied).

Cautions:

. You must use a DC adapter that supplies (regulated) 9 volts and delivers at least 300 milliamps. It center tip must be set to negative, and its plug must correctly fit the scanner's PWR DC 9V jack. The recommended adapter meets these specifications. Using an adapter that does not meet these specifications could damage the scanner or the adapter.

. To protect your vehicle's electrical system, always plug the adapter into the scanner before you plug it into your vehicle's cigarette-lighter socket. Always unplug the adapter from the vehicle's cigarette-lighter socket before you unplug it from the scanner.

add illustration.

1. Attach the size H Adaptaplug to the DC adapter so the tip reads negative (-).
2. Set the adapter's voltage switch to 9 V.
3. Insert the barrel plug into the scanner's PWR DC 9V jack.
4. Plug the other end of the adapter into your vehicle's cigarette-lighter socket.

Note: If the scanner does not operate properly when you connect a DC adapter, unplug the adapter from the cigarette-lighter socket and clean the socket to remove ashes and other debris.

Charging Rechargeable Batteries or a Rechargeable Battery Pack

Your scanner has a built-in charging circuit that lets you charge rechargeable batteries (Cat. No. 23-125, not supplied) or a rechargeable scanner battery pack (Cat. No. 23-288, not supplied) while it is in the scanner. To charge rechargeable batteries or a battery pack, simply connect an appropriate AC or DC adapter to the PWR DC 9V jack.

Note: If you want to take the battery pack out of the scanner to charge it, follow the instructions provided with the battery pack.

It takes between 14-16 hours to recharge rechargeable batteries or a battery pack that is fully discharged. You can operate the scanner while recharging the rechargeable batteries or the battery pack, but charging takes longer.

Note: Rechargeable batteries and a rechargeable battery pack last longer and deliver more power if you occasionally let them fully discharge. To do this, simply use the scanner until Low Battery! appears on the display. Then fully charge the rechargeable batteries or the battery pack.

Important: At the end of a rechargeable battery's or a rechargeable battery pack's useful life, it must be recycled or disposed of properly. Contact your local, county, or state hazardous waste management authorities for information on recycling or disposal programs in your area. Some

options that might be available are: municipal curb-side collection, drop-off boxes at retailers such as your local RadioShack store, recycling collection centers, and mail-back programs.

CONNECTING THE ANTENNA

Follow these steps to attach the supplied flexible antenna to the ANT jack on the top of your scanner.

add illustration.

1. Align the slots around the antenna's connector with the tabs on the ANT jack.
2. Press the antenna down over the jack and turn the antenna's base clockwise until it locks into place.

Connecting an Optional Antenna

The antenna connector on your scanner makes it easy to use the scanner with a variety of antennas, such as an external mobile antenna or outdoor base station antenna. Your local RadioShack store sells a variety of antennas.

Always use 50-ohm coaxial cable, such as RG-58 or RG-8, to connect an outdoor antenna. For lengths over 50 feet, use RG-8 low-loss dielectric coaxial cable. If your antenna's cable does not have a BNC connector, you will also need a BNC adapter (also available at your local RadioShack store).

Follow the installation instructions supplied with the antenna, route the antenna cable to the scanner, then connect it to the ANT jack.

Warning: Use extreme caution when installing or removing an outdoor antenna. If the antenna starts to fall, let it go! It could contact overhead power lines. If the antenna touches a power line, contact with the antenna, mast, cable or guy wires can cause electrocution and death! Call the power company to remove the antenna. Do not attempt to do so yourself.

CONNECTING AN EARPHONE/HEADPHONES

For private listening, you can plug an earphone or mono/stereo headphones (such as Cat. No. 33-177 or 20-210) into the (headphone symbol) jack on top of your scanner. This automatically disconnects the internal speaker.

add illustration.

Listening Safely

To protect your hearing, follow these guidelines when you use an earphone or headphones:

. Do not listen at extremely high volume levels. Extended high-volume listening can lead to permanent hearing loss.
. Set the volume to the lowest setting before you begin listening. After you begin listening, adjust the volume to a comfortable level.
. Once you set the volume, do not increase it. Over time, your ears adapt to the volume level, so a volume level that does not cause discomfort might still damage your hearing.

Traffic Safety

Do not wear earphone or headphones while you drive a vehicle or ride a bicycle. This can create a traffic hazard and can be illegal in some areas.

Even though some earphones and headphones let you hear some outside sounds when you listen at normal levels, they still can present a traffic hazard.

CONNECTING AN EXTENTION SPEAKER

In a noisy area, an amplified speaker (such as Cat. No. 21-541) might provide more comfortable listening. Plug the speaker cable's 1/8-inch (3.5 mm) mini-plug into your scanner's (headphone symbol) jack.

add illustration.

USING THE BELT CLIP

You can use the belt clip attached to the back of the scanner for hands-free carrying when you are on the go. Simply slide the belt clip over your belt or waistband.

CONNECTING THE CLONE CABLE

You can transfer the programmed data to and from another PRO-92 using the supplied clone cable. Connect the cable between each scanner's PC/IF jacks. You can also upload and/or download the programmed data to or from a PC using an optional PC interface kit.

UNDERSTANDING THE PRO-92

Once you understand a few simple terms used in this manual and familiarize yourself with your scanner's features, you can put the scanner to work for you. You simply determine the type of communications you want to receive, then set the scanner to scan them.

A frequency is the tuning location of a station (expressed in kHz or MHz). To find active frequencies, you can use the search function.

You can also search the search banks which are preprogrammed frequencies in the scanner's memory (see the table on page 20 for the frequency list). You can change the search frequency ranges.

When you find a frequency, you can store it into a programmable memory location called a channel, which is grouped with your other channels in a channel-storage bank. You can then scan the channel-storage banks to see if there is activity on the frequencies stored there. Each time the scanner finds an active frequency, it stays on that channel until the transmission ends.

A LOOK AT THE KEYPAD

Your scanner's keys might seem confusing at first, but this information should help you understand each key's function.

add illustration.

FUNC – lets you use various functions pressing this key along with other keys.
PRI – sets and turns the priority function on or off.
TEXT – lets you input text or lets you display inputted text.
STEP– changes the frequency step or displays step frequency during search.
MODE – changes the receive mode.
Key Symbol/LIT – turns on/off the display's backlight or locks/unlocks the keypad to prevent accidental entries.
SCAN – scans through the programmed channels or ID code.
TUNE – tunes to a frequency along with (up button) or (down button).
ATT – turns attenuation on to reduce the scanner's sensitivity, or turns it off to increase it.
(up button) or (down button) – selects the search direction during search or tuning to a frequency.
SEARCH – lets you search the ten search banks.
MANUAL – stops scanning and lets you directly enter a channel number.
1/DELAY – enters a 1, or programs a 2-second delay for the selected channel/search bank, or inputs characters 0 through 9.
4/GHI – enters a 4, or inputs characters G, H, or I.
7/PQRS – enters a 7, or inputs characters P, Q, R, or S.
0 – enters a zero, or inputs characters ., -, #, _, @, +, *, &, /, ', $, %, !, ^, (,), ?, –>, `, and ^.
L/OUT – lets you lock out a selected channel, lets you skip a specified frequency during search, or lets you lock out a selected ID code.
TRUNK – programs the trunking ID code or holds the trunking ID while scanning.

2/ABC – enters a 2, or inputs characters A, B, or C.
5/JKL – enters a 5, or inputs characters J, K, or L.
8/TUV – enters a 8, or inputs characters T, U, or V.
. – enters a decimal point (necessary when programming frequencies), space, or hyphen (in Motorola type I code setting).
PGM – programs frequencies into channels.
WX – scans through the 7 preprogrammed weather channels.
3/DEF – enters a 3, or inputs characters D, E, or F.
6/MNO – enters a 6, or inputs characters M, N, or O.
9/WXYZ – enters a 9, or inputs characters W, X, Y, or Z.
CL – clears an incorrect entry.
ENTER – enters frequencies, text, and so on.

A LOOK AT THE DISPLAY

(The displays of Manual Mode, Scan Mode, and Search Mode will be placed. See separate page)

UNDERSTANDING BANKS

Channel Storage Banks

To make it easier to identify and select the channels you want to listen to, channels are divided into 10 banks of 50 (00 to 49) channels each. Use each channel-storage bank to group frequencies, such as those used by the police department, fire department, ambulance services, or aircraft (see "Guide to the Action Bands" on Page 40). For example, the police department might use four frequencies, one for each side of town. You could program the police frequencies starting with Channel 000 (the first channel in bank 0) and program the fire department frequencies starting with Channel 100 (the first channel in bank 1).

Search Banks

This scanner is able to search 10 search banks. You can also replace a bank with one of the 60 pre-programmed search bands. (The default setting is as shown in Page 20.)

The following list shows the 60 pre-programmed search bands:

Low Freq. (MHz)	Hi Freq. (MHz)	Step (kHz)	Description
118.0000	136.9750	25	Air band
108.0000	118.0000	25	Air Nav
460.6375	460.8625	25	Airlines
460.8750	460.9750	25	Alarms
944.0000	952.0000	12.5	Brdcst Links
42.9600	43.6800	20	Business
151.9850	153.7250	5	Business
450.9250	452.1875	25	Business

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453.9875	454.9875	25	Business
460.9750	462.5500	25	Business
463.1750	465.0000	25	Business
851.0000	866.0000	12.5	Business
935.0000	944.0000	12.5	Business
33.0400	33.9800	20	Fire
29.7000	33.0400	5	Fixed/Mobile
33.9800	42.0200	20	Fixed/Mobile
46.6000	50.0000	20	Fixed/Mobile
928.0000	929.0000	12.5	Fixed
932.0000	935.0000	12.5	Fixed
952.0000	960.0000	12.5	Fixed
462.5500	462.7500	12.5	GMRS/FRS
467.5500	467.7500	12.5	GMRS/FRS
137.0000	144.0000	5	Government
148.0000	150.7750	25	Government
153.7250	156.2500	5	Government
158.6700	159.4650	5	Government
162.0000	173.2250	5	Government
173.4000	174.0000	5	Government
400.0000	420.0000	25	Government
453.0000	453.9875	25	Government
29.0000	29.7000	5	Ham 10 m
50.0000	54.0000	5	Ham 6 m
144.0000	148.0000	20	Ham 2 m
420.0000	450.0000	25	Ham 70 cm
902.0000	928.0000	12.5	Ham/ISM 33cm
150.9650	151.9850	5	Highways
462.9250	463.1750	25	Medical
156.2500	157.4250	25	Marine Band
161.7600	161.9150	25	Marine Band
380.0000	400.0000	50	Military
806.0000	823.9875	12.5	Mobile Units
894.0000	902.0000	12.5	Mobile Units
161.5650	161.7600	5	News Media
173.2250	173.4000	5	News/Film
450.0000	450.9250	12.5	News Media
452.9625	452.9875	25	Newspapers
462.7500	462.9250	25	Paging
929.0000	932.0000	12.5	Paging
42.0200	42.9600	20	Police
44.6000	46.6000	20	Police/Fire
460.0000	460.6375	25	Police/Fire
866.0000	868.9875	12.5	Police/Fire
160.2150	161.5650	15	Railroads
455.0000	460.0000	25	Rptr Inputs
465.0000	470.0000	25	ReptrInputs
157.4250	158.6700	5	Taxi/Tow

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159.4650	160.2150	5	Taxi
452.1875	452.9625	25	Taxi/Busses
470.0000	512.0000	12.5	T-Band
150.7750	150.9650	5	Tow Trucks

Note: The steps shown above are default values. You can select any desired step setting.

TRUNKING ID MEMORY

You can store up to 100 trunking ID codes in each channel-storage bank (Total: 1000 ID codes). The ID code which you stored in the scanner is referenced in scan close mode operation.

ABOUT TRUNK TRACKING

This scanner corresponds to the undermentioned trunking systems.

LTR Trunking System
Motorola Trunking System
EDACS Trunking System

Trunking System is a system to use a certain limited frequencies by the large number of people (or, some groups). (Refer to Frequency Guide of the separate volume for frequencies allocated in various places.)

When the trunk user transmits a signal, one frequency is chosen from among the allocated frequencies in Trunking System. The ID code by which the user is identified is sent with the signal at the same time. The transmitted electric wave is transmitted to the repeater, and is converted to another allocated frequency and it is transmitted from the repeater to the other party user. The other party user is identified by the ID code. This scanner follows after the two way communications by receiving the ID code which you want to monitor.

It is necessary to input all the frequencies allocated in the trunking system in the region which you want to hear in one channel-storage bank in this scanner to scan the trunking system. (See Storing Known Frequencies into Channels on Page 17.) It is necessary to input ID codes in the ID memory. (See Programming Trunked ID Number on Page 19 and Trunking Receiving on Page 31.)

About CTCSS/DCS

Continuous Tone Coded Squelch System (CTCSS) and Digital Coded Squelch (DCS) are two methods used to prevent interference by other radio communications.
CTCSS system is called as PL (Private Line) and DCS is called as DPL (Digital Private Line). Moreover, the DCS identifies the transmission by a three-digit digital code in the DPL mode instead of the tone.

PL

When the electric wave with an active transmission is received, the squelch is opened usually. However, when the CTCSS is used, the scanner selects whether to receive the signal detecting the tone before the squelch is opened.

PL codes are displayed according to the EIA standard CTCSS tones. These tones range from 67.0 Hz to 254.1 Hz. PL codes are displayed directly as a frequency. The user does not enter the code directly.

DPL (Indicated as DL on the display)

DPL works the same as PL but the difference is the tone or the digital code.
DPL codes structure allows a maximum of 4096 codes, however, only about 100 codes are actually used. DPL codes are displayed as:

Dxxx

Where xxx is an octal code. For example: D411. This is the industry standard. The user does not enter the code directly. The step key is pressed in channel programming mode to scroll through the range of allowable values.

Open vs. Closed Mode

During scanning, the voice frequency band code is used in the PL, DL, LT, MO, and ED modes in addition to the normal squelch. When a bank is in closed mode, this scanner receives only transmissions with specified ID codes are accepted. When transmissions that have no code, or a code that does not match the scanner's ID memory, the scanner does not receive the signal. FM and AM mode operates both Close or Open mode. In open scanning mode, all transmissions are accepted. Decoded IDs are displayed.

OPERATION

TURNING ON THE SCANNER AND SETTING SQUELCH

1. Turn SQUELCH fully counterclockwise until the indicator points to MIN before you turn on the scanner

add illustration.

2. To turn on the scanner, turn VOLUME clockwise. The opening message of Welcome To Multi-System Trunking appears on the display. After about 3 seconds, you hear a hissing sound.

add LCD illustration (Fig. 1)

3. Turn SQUELCH clockwise, just until the hissing sound stops.

Notes:
. To listen to a weak or distant station, turn SQUELCH counterclockwise. If reception is poor, turn SQUELCH clockwise to cut out weak transmissions.
. If SQUELCH is adjusted so you always hear a hissing sound, the scanner does not scan properly.
4. To turn off the scanner when you finish, VOLUME counterclockwise to OFF.

STORING KNOWN FREQUENCIES INTO CHANNELS

Good references for active frequencies are the RadioShack Police Call, Aeronautical Frequency Directory, and Maritime Frequency Directory. We update these directories every year, so be sure to get a current copy.

Follow these steps to store frequencies into channels.

1. Press MANUAL, enter the channel number where you want to store a frequency, then press MANUAL again. M and the channel number appears at the upper left corner on the LCD (for example: M100).

add LCD illustration (Fig. 2)

2. Press PGM. M changes to P.

3. Use the number keys and . to enter the frequency (including the decimal point) you want to store.

If you make a mistake, press CL key for short time (about 0.5 second) to delete 1 digit one by one and for long time (more than 1.5 second) to clear all digit.

4. Press ENTER to store the frequency into the channel. The blinking cursor disappears.

Notes:
. If you made a mistake in Step 3, Invalid Freq briefly appears and the scanner beeps when you press ENTER. Simply start again from Step 3.
. Your scanner automatically rounds the entered frequency to the nearest valid frequency. For example, if you enter a frequency of 151.473, your scanner accepts it as 151.470.
. Press FUNC then press DELAY/1 to turn off or on the delay function. If you want the scanner to pause 2 seconds on this channel after a transmission ends before it proceeds to the next channel (see "Delay" on Page 25). The scanner also stores this setting in the channel.

5. If necessary, change the receiving mode. If you select PL or DPL mode, enter the PL or DPL code by pressing STEP (change to upward) or FUNC then press STEP (change to downward).

Note: We recommend that you allocate one channel storage bank to put the frequencies of one kind of the receive mode.

6. To program the next channel in sequence, press PGM and repeat Steps 3 through 5.

Inputting the Text

You can enter 12 characters as text in each channel. To input the text, follow these steps:

1. Press MANUAL, enter the channel number where you want to enter the text, then press MANUAL again. M and the channel number appears at the upper left corner on the LCD (for example: M100).

2. Press PGM. M changes to P.

3. Press TEXT. The cursor appears.

4. Enter the text to use the numeral keys.

Note: For example: Input "HAM 6m" as follows:
. "H" Press 4 then press 2.
. "A" Press 2 then press 1.
. "M" Press 6 then press 1.
. "space" Press ..
. "6" Press 1 then press 6.
. "m" Press 6, FUNC then press 1.

5. Press ENTER to input the text.

Text for Bank Name

1. Press PGM then select channel bank you wish.

2. Press FUNC then press 6. The cursor appears at the fourth line on the display.

add LCD illustration (Fig. 3)

3. Enter text as above step 4.

Press ENTER to shift the text to the fourth line and input the text.

The scanner stops scanning and receives the signal, programmed bank name appears at the fourth line on the display.

Note: If the scanner detect ID code while PL, DL, LT, MO and ED mode, display changes to ID number from bank name.

Input List

Key	Character
1	1, 2, 3, 4, 5, 6, 7, 8, 9, 0
2	A, B, C, a, b, c
3	D, E, F, d, e, f
4	G, H, I, g, h, i
5	J, K, L, j, k, l
6	M, N, O, m, n, o
7	P, Q, R, S, p, q, r, s
8	T, U, V, t, u, v
9	W, X, Y, Z, w, x, y, z
0	-, +, #, _, @, +, *, &, /, ', $, %, !, ", (,), ?, -->, `, ^
.	space key
CL	back space key

Note: To enter the underlined characters, press FUNC after pressing the numeral key.

PROGRAMMING TRUNKING ID CODES

You can program up to 100 trunking ID codes in each bank (Total 1000 ID codes). In the following trunking systems, if the scanner receives the signal and its ID code matches with the programmed ID code in the scanner, it receives the signal. (CLOSE mode only)

LTR trunking system (LTR)
Motorola trunking system (MOT)
EDACS trunking system (ED)

See "Trunking Receiving Section" on Page 31 and "Storing Known Station ID Code into Bands" on Page 36.

FINDING AND STORING ACTIVE FREQUENCIES

You can search for transmissions within ten ranges of frequencies, called a search bank. The search bank is divided into 10 search bands. You can change the bands with the 60 pre-programmed search bands in the scanner. You can also change the search bank's search ranges manually.

Notes:
. You can use the scanner's delay feature while using search. See "Delay" on page 26.
. The scanner does not search locked-out frequencies while searching ranges.

Searching a Preprogrammed Frequency Range

The scanner contains these preprogrammed search ranges, stored in search banks (1-10).

Search Bank	Search Range (MHz)	Description
0	460.000-460.625	Police
1	153.725-156.000	Police/Fire
2	462.925-463.175	Medical
3	118.000-136.000	Aircraft
4	156.250-157.425	Marine
5	866.000-868.9875	800 MHz
6	50.000-54.000	6 Meter Ham
7	144.000-148.000	2 Meter Ham
8	440.000-450.000	70 cm Ham
9	462.550-462.725	User Bank

Follow these steps to select preprogrammed search ranges and search them for active frequencies.

1. Press SEARCH. The scanner searches active search bank.

add LCD illustration (Fig. 4)

Note: To revert a search direction, press (down button) or (up button).

2. Using the number keys, enter the search bank number for each search range you want to select or remove.

3. When the scanner finds an active frequency, it stops searching. To save the frequency into a channel in the channel storage bank (bank 9 only), press FUNC then press ENTER. Stored @ 9xx appears on the display (xx: channel number). Press (up button) or (down button) to continue searching for additional active frequencies.

Notes:
. During search, you can manually change the band mode or frequency step. See "Changing the Receive Mode" or "Changing the Frequency Step" on Page 29.
. If bank 9 in the channel storage banks does not contain any empty channels, Bank 9 full. appears on the display's lower line.

. To pause the search, press FUNC then press STEP. ** PAUSED ** appears on the display and the scanner stops frequency search. To start search again, press FUNC then press STEP again.

Tips:

If you want to store a frequency into a specified channel, you can store it with the following procedure.

a. When the scanner stops on the frequency, press FUNC.
b. Press TUNE.
c. Press MANUAL. And select specified channel using number key then press MANUAL again.
d. Press PGM.
e. Press FUNC, then press TUNE to store the frequency.

If you want to return to the search mode, press SEARCH.

Changing a Search Range with one of the 60 Preprogrammed Ranges

You can replace the search range with one of the 60 preprogrammed ranges:

1. Press FUNC then press SEARCH to enter search program mode. PSR (Program Search Range) and the search bank number where the current channel is in appears at the LCD's upper left corner.

add LCD illustration (Fig. 5)

2. Press (up button) or (down button) to select the desired search bank you want to replace.

3. Press FUNC then press 5. ?SR and the search bank number appear at the LCD's upper left corner.

add LCD illustration (Fig. 6)

4. Press (up button) or (down button) key to select the preprogrammed search range.

5. Press ENTER to replace the search range.

Changing a Search Range Manually

Following procedure as replace the search range manually:

1. Press FUNC then press SEARCH to enter search program mode. PSR and search bank number appear at the LCD's upper left corner.

2. Press (up button) or (down button) key to select the search bank number.

3. Use the number keys to enter the lower range you want to search, then press ENTER.