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TRIDENT

5MHZ - 1300MHZ, WIDE RANGE MONITOR

TR-980

INSTRUCTION MANUAL

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Specification of TRIDENT TR-980

Receiver Coverage	5MHz - 1300MHz
Receiver Mode	AM, NFM, WFM
Receiver Circuitry	Triple Superhetrodyne
Frequency Increment	5, 10, 12.5, 25, 30 (KHz)
Memory Channel	125 channels (25CH x 5 banks)
Search Banks	5 programmable by user
Priority Channel	Ban A channel 01 fixed
Priority Sampling	Every 2 seconds
Delay/Hold	Delay for 2 seconds

Receiver sensitivity

	N-FM 12dB SINAD	AM 10dB S/N	FM 40dB in S/N
5 - 10 MHz	1.0uV	2.0uV	-
10-513 MHz	0.5uV	0.8uV	10uV
513-1000 MHz	0.8uV	-	15uV
1000-1300MHz	2.0uV	-	-

Receiver Circuit	Triple conversion

IF combination

1st IF	
5-299.995MHz	556.325MHz
300-512MHz	249.125MHz
513-797.995MHz	58.075MHz
798-1105.995MHz	249.125MHz
1106-1300MHz	556.325MHz

2nd IF - 58.075MHz, 3rd IF - 455KHz
WFM 3rd IF - 10.7MHz

Antenna connection	50 ohm unbalanced, BNC
Audio output	More than 90mW into 8 ohm load 10% THD
Power Source	4.8VDC Nicad. Batteries 6.0VDC Dry cell batteries 12VDC external 100VAC, 120VAC, 220VAC (by AC/DC adaptor)
Memory backup	Non-volatile memory
Dimensions	55(W) x 41(D) x 154(H) mm
Weight	270 gram

Priority

This feature enables you to carry on scanning, searching or whatever while the scanner automatically checks A01 out of 125 memory channel every 2 seconds for activity. Store your most important frequency into A01 for enjoying the priority function.

Priority can be toggled on or off by pressing the PRY /LL UL key, which will show the PRY indicator in the display to go on or off.

Light

Pressing the **LIGHT** switch on top panel will cause the display to be illuminated for approximately 2 seconds and then distinguish automatically to save battery life.

Troubleshooting

Before returning your receiver for repair please check the following.

1. No power
* Check if you have batteries inside of the battery compartment in correct directions.
* If you use dry cell batteries, check if these are still in life.
* Check when you use the Ni-Cad. battery pack, if such is fully charged.
* AC adaptor is correctly connected.
* The power connection polarity is correct.

2. Can not charge
*Make sure that power switch located top of the radio is off.
*Check if the battery pack is over charged or over discharged.

3. No LCD display
*Check if the battery pack is fully charged and appropriate power is applied.
*If you use dry cell batteries, check if these are still in life.

4. Poor sensitivity
* If the (ATT) is depressed then the sensitivity is reduced. Press it again for DX position.
* Check the antenna is correctly connected. The antenna may be faulty or short circuited (maybe in the connector). Or if you connect the radio to external antenna, check coaxial cable.
*The antenna may be miss-matched and unsuitable.

5. No audio output
*The power switch is turned on.
*The volume control is properly used.
* Background noise is audible when the squelch control is turned fully anti-clockwise.
*If a headset, earphone or external loudspeaker is used, check if it is correctly fitted into the appropriate socket.

About this manual

It is very important that you understand that this manual as been written to be read from beginning to end and is not an indexed reference. Also it is crucial that you actually try out every new command on your scanner as you read about in this manual to familiarize yourself with the unit. If you follow this advice you will get the most out of this manual.

The outside of the unit.

The front of the TR-980 comprises, in the bottom one third, a built in loudspeaker and, in the top two thirds, a keyboard and LCD display.

The display shows a number of bits of information which will all be mentioned and explained in the process of explaining the general operation of the unit.

The keypad is made up of 25 keys divided into two distinct groups: The numerical part and the command or function part.

These key will all be explained as you read through this manual.

On the left hand side of the TR-980 is a small concentric socket used to feed power to the unit for both operation from an external (11 to 18 volt) power source and charging of the internal Ni-Cad. battery pack when such is applied.

On the top of the TR-980 can be found 2 controls, 3 switches,1 connector and 1 receptacle.
A BNC antenna connector which can be used either to mount an antenna, such as the rubber duck antenna supplied, directly on the unit or for connection to an external antenna; and a 3,5mm receptacle for earphones or external speaker of 8 ohms or higher.

The two controls are volume, squelch.

The three switches are WFM selection switch, LCD light switch and antenna attenuator switch (10dB).

These will be explained later.

Controls and functions

Top Panel

1. PWR (power)Switch and VOL(volume): At fully counter-clockwise position, the TR-980 is turned off and rotating in clockwise turns on the radio with "click" and further rotation sets the desired level of audio from the receiver.

2. SQL(squelch) and BFO(beat frequency oscillator): SQL is provided to eliminate the background noise on unoccupied frequencies, and also to enable the receiver to decide whether or not to stop on a frequency when searching or scanning. Turn the SQL control from the fully counter-clockwise position until the background noise just disappears. This is the most sensitive setting for the SQL. It is usually preferable to advance the squelch control a little way further clockwise than the most sensitive setting to avoid inadvertent stopping on noise or very weak signals.

3. ATT switch: For most uses, pushed out position is used for most sensitive condition for the receiver. However, when operating the TR-980 in the presence of very strong signals such as those from TV stations or FM broadcast transmitters, some interference effects may be apparent. This can take the form of increase levels of background noise, or spitting noises occasionally heard on peaks of modulation from the interfering source, or strange spurious signals generated by intermodulation between the strong signals. The cure of most of these effects is the use of the ATT switch in pushed in position.

5. LIGHT : Pressed momentarily, this will illuminate the display for approximately 2 seconds, after which the lamp will automatically be extinguished.

6.W.FM: Toggles between Wide FM or other modes selected regardless the mode displayed on LCD. As long as WFM indicator lamp located up right corner of front panel is illuminated, the radio is in wide FM receiving mode. When this lamp is off, mode display on LCD is the mode in which the radio is.

7. EAR: This is used for connection of either the earphone supplied, or an external headset or a loudspeaker. When a plug is inserted into this jack, the internal speaker of the TR-980 is automatically disconnected. The impedance of the external load should be 8 ohms or greater.

8. ANT: This is a standard BNC high frequency connector mounted on the top panel of receiver.

Front Panel and Right-hand side of the receiver

CHG: This concentric socket is mounted on the side of the case and is used for connection of the mains charger supplied, or the DC power cord supplied, or any suitable 11 - 18 volt DC supply.

DISPLAY: This provides comprehensive information for the users in easy to understand form.

Keyboard controls

1. First of all we have the numerical keys from 0 to 9, plus the decimal point (.). These are used for entering frequency, frequency step size, memory channel number, bank number, and so on. The same keys are used in the bank select mode, in which case the number 0 to 9 correspond to the frequency bands listed in the operating paragraph of this handbook. The bank designations are shown on the lower side of each number key.

2. CLEAR. (.): Press once to enter a decimal point when entering frequency information. Press twice to clear an incorrect entry.

3. ENTER: Used to enter frequency after selection by the keypad, or to complete many memory changes or operations.

4. SEARCH: Used to start the frequency search action of the receiver; also used to manually advance frequency after the search has stopped.

5. SCAN: Used to start the memory scanning system of the receiver; also used to manually advance the memory channels when the scan has stopped.

6. MANUAL: Used to engage the manual mode of receiver control, that is when the user wishes to directly enter a frequency of interest into the receiver, or directly select any memory channel.

To program the search memory range, step size and mode, press:

While you are in search mode(press SEARCH to go into search mode if you are in other mode),

1. Press SEARCH PROGRAM.

2. Press one of letter keys A through E to select search range memory name where you would like to store certain search range.

3. Display will show one of letter A - E according to the letter key you pressed plus LL. LL stands for lower limit.

4. Enter lower limit frequency of the range you would like.

5. Press ENT to confirm the lower limit frequency you just entered

6. Display will automatically show the search range memory name. One of A through E plus UL. UL stands for upper limit.

7. Enter upper limit frequency of the range you would like.

8. Press ENT to confirm the upper limit frequency you just entered.

9. Display starts blinking mode indicator AM or FM currently selected. If blinking mode is the one you would like, press ENT. If not, toggle it to the mode you would like by pressing AM FM key and then confirm the mode by pressing ENT.

10. Display starts blinking step frequency indicator KHz to prompt you to select search step frequency. There are choice of 5KHz, 10KHz, 12.5KHz, 25KHz, and 30KHz step. By pressing INC key momentarily, you can advance the choice from 5 to upward until 30 and them back to 5 to start again. Select the step you would like and confirm the step by pressing ENT.

For example, to store 118MHz to 136MHz, in 12.5KHz step, in AM mode to search range memory B, press;

SEARCH
SEARCH PRROGM
letter key **B**
1 1 8
ENT
1 3 6
Select AM or FM by toggling **AM FM** key and after selected
ENT
Select 12.5KHz step size by toggling **INC** key and after selected
ENT

In scanning mode DELAY/HOLD only toggle in (DLY is displayed) out (no display) which will change the resumption of scanning time from immediate to approximately 2 seconds. This is helpful when you are trying to catch an answer-back to a message on the same frequency.

Scanning.

The scan mode listens to frequencies stored in the bank and channels and stops to let you hear active transmissions, then resumes scanning after the transmission is completed. To use scan mode you must first store frequencies into ban and channels using manual mode as described earlier. (see page 4 - 5).

Press **SCAN** to start scanning. Press **MANUAL, red arrow 4 key or red arrow 7 key** to stop.

While scanning, banks can be added or deleted from the scan list by simply pressing the letter keys A through E. If the bank is in the list, its bank letter display at the upper right will be lighted. This is an off/on toggle function, i.e., press once to change from on to off, or vice versa, press again to return to original state.

Channels of not of current interest, or those receiving interference may be locked out by pressing LOCKOUT when scanning has stopped on the undesired frequency or while you are on the undesired channel in the manual mode.

Lock out can be removed by once again accessing the channel and then pressing the LOCKOUT key. The L/O indicator in the display will go out indicating that the channels is once again in the list.

You can press manual to stop scanning and listen to a particular channel. From there, you can advance one scan channel at a time by repeatedly pressing the MANUAL key. You can also stop scanning by red arrow 4 key or red arrow 7 key. This allows you to manually go forwards or backwards through scan channel which are not locked out.

Searching.

Pressing **SEARCH** will cause the unit to begging searching repeatedly through all selected search memory ranges.

The display will show that the unit is running up through frequencies until the upper limit is reached, then start searching again from lower limit to upper limit. You can revert to "manual" search mode during search by pressing either red arrow 4 or red arrow 7 keys. This allows you to move either upward or downward one step at a time. You can also reverse direction of the search by pressing the 4 or 7 keys then again pressing **SEARCH.**

If the TR-980 searching on a busy frequency and you wish to store that frequency in a memory then, when the search stops, press **ENTER (memory number) ENT.** For example, if the search stops on a frequency and you wish to store that frequency for future use in bank B channel 13 then press: **ENT B 1 3 ENT.**

Search memory range(A through E) can be added or deleted from the or search schedule by simply pressing the letter keys A through E by toggling it on or off on LCD display. The letter(s) appear(s) on the LCD display is (are) active search memory range. As long as more than 2 search memory range are activated, these are linked together.

7. Red Up arrow (numeric key 4) and **Red Down arrow**(numeric key 7): In search mode allows manual forward or backward stepping through frequencies

8. SEARCH PROG: Used in programming search memory ranges.

9. PRY LL/UL: Toggle priority channel (Bank A, channel 1) on or off in scan mode.

10. LOCKOUT/INC: Used to lockout the channels not of interest. Also used to select search frequency increment during search memory range programming.

11. AM/FM : To select narrow FM or AM as required. W.FM push switch is to over ride the mode to Wide FM receiving mode.

12. DELAY/HOLD: Press to change from DELAY to HOLD and back again sequentially in both search and scan mode. When "HOLD" is shown on the display, the scan or search stops on a busy channel and remains there even after the signal has gone off. When "DELAY" is shown on the display, the scan or each stops on a busy channel, but then automatically resumes the search or scan approximately 2 seconds after the signal has gone off.

13. Key A through E: Used to select the desired memory bank or search bank when scanning or searching. Selects one or all of 5 banks of 25 channels in scanning mode. Or 5 search memory ranges in search mode.

Operating the unit.

This manual assumes that you understand the basics of scanners. If you don't know what the squelch control does, for example, then stop here and ask for help from someone who can advise you.

Where text appears in BOLD UPPERCASE it means you must press the keys exactly as shown. For sample: **MANUAL A 0 1** means press the MANUAL key followed by the numerical keys 0 and 1.

Storing frequencies in memory.

The TR-980 has 125 memory locations divided into 5 banks, i.e., Bank A, Bank B, Bank C, Bank D and Bank E, o 25 memories each. In addition, there are 5 search range memories Bank A through Bank E accordingly.

The memory location is displayed as the combination of letter A through E and two digits number in the range A01 to E25. The first section is the bank name, A through E and the last two digits are the channel number so that bank A, channel twenty two is shown as A22.

1. Storing frequency is always done by selecting bank and channel number where you would like to store the frequency.

   There are two different ways to select bank and channel number. But you always have to be in manual mode. As you may notice by now, when TR-980 is turned on, the radio always starts searching Bank A to find new active frequencies regardless the setting you were in before you turn off the radio. To go to manual mode, press **MANUAL.** TR-980 goes to manual mode bank A channel 01. **A01** and the frequency currently stored on A01 is displayed.

A) When you press **MANUAL**, TR-980 goes to manual mode bank A channel 01. A01 and the frequency currently stored on A01 is displayed.
When you press **MANUAL** again you can advance a channel in the bank and so on. If you go to SCAN mode instead by pressing **SCAN** and then go to SEARCH mode by pressing **SEARCH**, now press **MANUAL**, they you go back to the bank and channel numbers where you stopped SCAN by changing the mode to SEARCH.

B) From MANUAL mode, when you press one these bank keys **A through E** the radio goes to direct channel access mode of the bank. DIR-ACC is displayed and CH display starts blinking to prompt you to enter channel number to where you would like to go. When you enter **channel number** by using **numerical keys**, you can jump to the channel of the bank instantaneously and the frequency currently stored is displayed.

Important principle to remember.

1. TR-980 starts searching when you turn on the radio regardless previous setting.

2. MANUAL mode is relating the to SCAN mode and therefore whenever **MANUAL** is pressed the radio goes to the bank and channel where the radio was in previous SCAN mode operation.

By selecting bank name and channel number by either way as described above. Now you are ready to store the frequency to the selected bank name and channel. Example, select bank A channel 05 by direct access way and store 144MHz in Narrow FM mode.

MANUAL A 0 1 1 4 4 ENT

Now if FM is displayed on LCD to indicate that the bank and channel is in FM mode confirm it by pressing **ENT.** If AM is displayed on LCD to indicate that the bank channel is in AM mode, press **AM FM** to toggle it to FM and confirm it by pressing **ENT.**

CAUTION: Make sure that W.FM switch is out position otherwise. If the W.FM switch is depressed, the radio is going to over ride to Wide FM (receiving mode used in FM broad casting or TV audio transmission). This W.FM mode can not be stored into memory of radio and this is rather hardware mode selection after you set certain Wide FM mode receiving frequencies.

2. To recall any memory press **MANUAL** one of **A through E and channel number.** For example: To recall bank B, channel 25 press: **MANUAL B 2 5.**

Scanning and Searching

It is important to appreciate the difference between scanning and searching. **SCANNING** is the automatic, sequential monitoring of frequencies stored in the memory banks while **SEARCHING** is the sequential monitoring of a range of direct frequencies. For example, if you had stored all the local airport frequencies in bank 1 you would **SCAN** bank 1 to automatically monitor activity on any of these pre-stored frequencies. If, however, you wanted to check the entire range of frequencies from 118MHz to 137MHz to try and find out which frequencies were in use then you would **SEARCH** the range 118MHz to 136MHz

Now there are, as mentioned earlier, 125 memories for storage of spot frequencies as well as another 5 memories for storing SEARCH ranges. Don't confuse the two. This manual refers to the ten banks of a hundred memories as memory BANKS and the individual 25 memories in each bank as CHANNELS and the 5 search range memories as SEARCH MEMORIES or SEARCH RANGE MEMORIES. Each of the 125 channels store a frequency and a mode (AM/FM) while the 5 search memories each store a lower and upper frequency limit, step size and AM or FM mode. As mentioned earlier, Wide FM mode can not be stored. W.FM mode is only selected when the **W.FM** switch is depressed.

This means that you can store, say, all the air traffic frequencies in bank 1, fire departments in bank 2 etc..

You can store frequency RANGES in the 5 search memories. That is to say you could program the range 144MHz to 146MHz, step size 25KHz, mode FM into search memory A. Then, every time you tell the unit to SEARCH memory 1 it will continually search through the range 144MHz to 146MHz FM in steps of 25KHz.

Also important is the feature whereby certain banks or search memories can be either excluded, included or linked in the operation.

While scanning or searching;

Banks(A through E) or search memory range(A through E) can be added or deleted from the scan or search schedule by simply pressing the letter keys A through E by toggling it on or off on LCD display. The letter(s) appear(s) on the LCD display is (are) active bank(s) or range(s).

Bank setting for scanning is separate from search memory range setting for searching. For example you can activate only A Bank for scanning and activate B search range memory and C search range memory. As long as more than 2 banks are activated, these are linked together. The same is applied for search memory ranges selected.

During searching, when a busy frequency is found the scan or search will stop. What happens next depends on the status of DELAY/HOLD. Pressing the DELAY/HOLD key will toggle between DELAY and HOLD showing the relevant status on the display.

In hold mode, the scan or search will stop on a busy frequency and stay there until you tell it to move on by pressing **SEARCH.**

In DELAY mode the search will resume automatically approximately two seconds after the frequency the unit stopped at becomes quiet. (This means, in practice, when the squelch closes.)