



***CITATION 20
INTELLIGENCE KIT***

OPERATING INSTRUCTIONS

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CITATION 20

SYNTHESIZED INTELLIGENCE KIT

DESCRIPTION

The Tactical Technologies Inc. CITATION 20 Synthesized Briefcase Intelligence Kit is a multipurpose system designed for portable receiving and/or recording of covert intelligence gathering operations.

The receiver is a highly sensitive narrow band synthesized VHF-FM receiver with a 100 channel memory that operates in the 150-174 MHz range and is designed to meet the NTIA-102 narrowband (12.5 kHz channel spacing) standards. The receiver can also be set to receive transmissions from devices designed prior to the NTIA-102 standard (25 kHz channel spacing).

An informative LCD display and multiple LED bar graphs highlight the Citation 20's control panel. The unit is easy to program either in the Tech Office or "on the road". The unit's software features a "FIELD SECURE" mode that eliminates the numeric frequency information from the LCD display and leaves only the channel number and the assigned alpha/numeric name. In this mode, the programmed frequency list is protected from additions or subtractions.

The recording system comes with a high quality Marantz PMD 201 cassette recorder, and the monitoring system is enhanced with Tactical Technologies Inc.'s own dual band Digital Audio Controls. Bass and/or Treble frequencies of the received audio can be monitored during initial reception, or during playback of a recording. These tonal adaptations will NOT be recorded via the on-board Marantz, thus retaining the integrity of the original recording. Also included as standard equipment is an Adaptive Digital Audio Filter (DSP switch), which can eliminate unwanted background noise from the received audio, or from a pro-recorded session. This ADAF audio also can NOT be recorded via the on-board recorder.

The panel includes many illuminated displays and switches - all of which can be turned off so that the panel remains dark for night time operations when this is a necessity.

As an option, the CITATION 8 can be equipped with descrambling. This will permit decoded receiving/recording of a scrambled transmission from a compatibly scrambled Tactical Technologies Inc. transmitter or repeater.

GENERAL OPERATIONS

INITIAL SETUP

POWER

- 1.) Select one of the three possible power sources you will be using during operations.
 - a.) Internal Rechargeable Battery Pack.
No additional setup is required. Check to make sure battery is fully charged. See section entitled "CHARGING AND CARING FOR THE INTERNAL BATTERY"
 - b.) External 12 VDC power source.

Connect the single pin female connector found on the 12VDC cigarette lighter cable to the male connector found on the left outside panel of the Citation 20 case. Push the cable end connector into the panel mounted connector on the case. Lock the connectors together by rotating the sleeve on the cable end clockwise to thread it onto the panel mounted connector. Hand tighten only.

c.) 110 VAC power source.

Connect the 3 pin female connector found on the 110 VAC cable to the male connector found on the left outside panel of the Citation 20 case. Locate the correct alignment configuration, and push the cable end connector into the panel mounted connector on the case.

2.) Turn power on by pushing the **POWER** switch. The LED indicator on the switch should illuminate and the LCD display should come on, indicating that the unit is operational under the selected power source.

PROGRAMMING THE CITATION 20

The Citation 20 can store frequency and name information for up to 100 channels in its nonvolatile, internal memory. Use the **KEYPAD** for data entry and retrieval.

LAMP

The **LAMP** key toggles the LCD displays illumination on and off.

It is advisable to use the Lamp sparingly during internal battery operations in an effort to conserve battery life.

PROGRAMMING A FREQUENCY ...

1.) SELECT A CHANNEL TO BE PROGRAMMED

A.) Press the **CHNL** key. A blinking cursor will appear at the first digit of the **NUMERIC CHANNEL NUMBER** on the display. Enter a two digit channel number from 00 to 99. Or.....

B.) Press the **UP ARROW** or the **DOWN ARROW** keys to scroll through the channel numbers. Stop at the desired channel.

The Citation 20 retains "last active channel frequency information" in its memory at all times. When changing channels from an active, programmed channel to a blank, non-active channel, the synthesizer will keep the receiver tuned to the last active frequency until a new frequency is either programmed in, or a channel is selected which has been preprogrammed. So even though the display may be on a blank channel, the receiver may still be tuned to an active channel. This operation is normal.

2.) ENTER A FREQUENCY FOR THE DISPLAYED CHANNEL

Press the **FREQ** key, then enter the frequency.

Once the **FREQ** key is pressed, the display shows a blinking cursor on the **FREQUENCY** portion of the display.

The frequency portion of the display looks like this:



Your data entry begins with the tens column. The hundred's column and the decimal point are permanently displayed.

The standard Citation 20 will accept any frequency from 150.0000 MHz through 174.0000 MHz, in 2.5 kilohertz steps. Data entry into the thousandths column must be either a 0, 2, 5, or a 7. The Citation will automatically fill in the last column. A "0" in the thousandths column yields a "0" in the final column, "2" yields a "5", a "5" yields a "0", and a "7" yields a "5". Any other entry in the thousandths column is an invalid entry, and the Citation will return a blinking cursor, requesting valid data. Please see the following example:

Your initial entry is 154.65

154.65 -> you enter "0"	-> display shows 154.6500 MHz	Valid
154.65 -> you enter "1"	-> display shows 154.65?? MHz	Invalid
154.65 -> you enter "2"	-> display shows 154.6525 MHz	Valid
154.65 -> you enter "3"	-> display shows 154.65?? MHz	Invalid
154.65 -> you enter "4"	-> display shows 154.65?? MHz	Invalid
154.65 -> you enter "5"	-> display shows 154.6550 MHz	Valid
154.65 -> you enter "6"	-> display shows 154.65?? MHz	Invalid
154.65 -> you enter "7"	-> display shows 154.6575 MHz	Valid
154.65 -> you enter "8"	-> display shows 154.65?? MHz	Invalid
154.65 -> you enter "9"	-> display shows 154.65?? MHz	Invalid

If you attempt to enter an invalid frequency, the Citation will either:

- 1.) Return the blinking cursor to where your initial error happened - requesting you to re-enter your data. Or
- 2.) Make you complete the programming, leaving at least one "?" as part of the displayed frequency. If this happens, press the **FREQ** key again, and re-enter your data.

To change the frequency of a channel that has previously been programmed: Simply press the **FREQ** key, and over write the old channel with the new data.

If you make an error in your data entry.....

- 1.) Complete the frequency, then over write the wrong entry with the correct one. Or....
- 2.) Press the **POWER** button, turning the unit off, BEFORE you have completed the new frequency data entry. Then turn it on again. This will return the channel to its original frequency.

Once a channel is programmed, it can not be individually cleared from memory.

NAMING THE CHANNEL.....

Enter up to 12 Alpha/Numeric characters to name the channel.

- 1.) Press the **NAME** key
The cursor will blink on the first of the twelve alpha/numeric segments on the display. This display area is called the **ALPHA/NUMERIC CHANNEL NAME** .
- 2.) Enter the first character of the channel name using the **DATA ENTRY PAD**
Upper and lower-class letters A-Z, the numbers 0-9, and a BLANK space are available for the channel name. Use the UP ARROW and/or DOWN ARROW keys on the keypad to scroll you through the selections.
- 3.) Press the **NAME** key again to set the selected character and move the cursor to the next letter.
Enter the next character using the procedures described above.
- 4.) Continue to enter characters, pressing the NAME key each time to set the character and move to the next letter. When finished, press the NAME key repeatedly until the cursor disappears from the display.

If you make a mistake in data entry

Press the NAME key repeatedly until the cursor scrolls back to the erroneous character. Over write the wrong data with the correct character. When finished, press the NAME key repeatedly until the cursor disappears from the display.

FIELD SECURE MODE vs. FULL PROGRAMMING MODE

The initial operating condition of a new Citation 20 is called the FULL PROGRAMMING MODE. In this state, all available functions are accessible and operational to the user, including synthesizer programming and memory clearing. The Citation 20 is equipped with a second operating condition called the FIELD SECURE MODE. Field Secure Mode eliminates some functions and adds protection to the memory. Field Secure adds the following features to the unit:

- 1.) WRITE PROTECTED
 - a.) Frequencies that are preprogramming into the unit can not be changed.
 - b.) New frequencies can not be added.
 - c.) Names that are preprogrammed can not be changed.
 - d.) The overall memory of the Citation 20 can not be cleared.
- 2.) HIDES FREQUENCY
 - a.) LCD only displays NUMERIC CHANNEL NUMBER and ALPHA/NUMERIC CHANNEL NAME. The Frequency is eliminated - thus preventing field agents from seeing actual operating frequency numbers.
 - b.) Disables the NAME and FREQ buttons on the keypad.

TO PLACE THE UNIT IN FIELD SECURE MODE:

- a.) With the unit in Full Programming Mode, turn the Citation 20 OFF. Use the small FSM tool provided and insert it into the female RCA LINE jack found on the panel. Inside this jack is a switch. Using the tool, lightly press on the switch, then extract the tool. When the switch is engaged, the Citation 20 will be in FIELD SECURE MODE. (When the switch is dis-engaged, the unit is in FULL PROGRAMMING MODE.)
- b.) Turn the POWER switch ON.
- c.) Observe display - see that the numeric frequency information has been deleted.
- d.) The Citation will remain in Field Secure Mode, regardless of power conditions, until switched to revert back to Full Programming Mode.

TO RETURN THE UNIT TO FULL PROGRAMMING MODE:

- a.) With the unit in Field Secure Mode, turn the Citation 20 OFF. Use the small FSM tool provided and insert it into the female RCA LINE jack found on the panel. Inside this jack is a switch. Using the tool, lightly press on the switch, then extract the tool. When the switch is dis-engaged, the Citation 20 will be in FULL PROGRAMMING MODE.
- b.) Turn the POWER switch ON.
- c.) Observe display - see that the numeric frequency information has returned.
- d.) The Citation will remain in Field Secure Mode, regardless of power conditions, until switched to revert back to FIELD SECURE MODE.

CLEARING THE MEMORY

Should it become necessary to clear the entire memory of the Citation 20:

- 1.) Turn the unit ON.
 - 2.) Make sure the unit is in the FULL PROGRAMMING MODE.
 - 3.) Select CHANNEL 00.
Press and hold the **UP ARROW or DOWN ARROW** key until CHANNEL 00 is on the display.
or press the CHNL button and then type in 00 from the keypad
 - 4.) Press and release the FREQ key.
 - 5.) Press and release the ENTER key.
 - 6.) Using the FSM tool, insert the tool into the LINE jack. Engage the FSM switch inside the jack **AND HOLD THE SWITCH IN THE ENGAGED POSITION FOR AT LEAST 3 SECONDS**. Then release the switch.
 - 7.) Depress this switch with the tool once again, to dis-engage the switch and return the unit to FULL PROGRAMMING MODE.
 - 8.) Observe the display, you will see the frequencies being erased, from 00 through 99.
 - 9.) Turn the Citation OFF via the POWER switch.
 - 10.) Turn the Citation ON via the POWER switch.
- All the channels will now be erased.

NOTE: MAKE SURE YOU HAVE A WRITTEN COPY OF ALL YOUR FREQUENCY INFORMATION BEFORE CLEARING THE MEMORY OF THE CITATION 20. THIS PROCESS IS NON-REVERSIBLE.

NOTE: YOU CAN ERASE THE MEMORY FROM ANY CHANNEL NUMBER THROUGH NUMBER 99 BY SELECTING ITS CHANNEL NUMBER INSTEAD OF 00 (step 3 above).

As an example - you have channel numbers 00-12 programmed with frequencies you wish to keep. Channel 13, 20, 39, and 80 have information stored in them that you don't need. Simply select channel '13' when you reach step 3 in the directions. The memory will be cleared from channel 13 through 99, leaving the information in 00 through 12 intact.

You can NOT individually clear a specific channel, or an interior range of frequencies. The range must go from a channel (with 00 being the lowest) through to 99.

ADD THE ANTENNA

Select either the Internal Antenna or the use of an External Antenna

FOR AN EXTERNAL MAGNETIC MOUNT ANTENNA

- a.) Push the female BNC connector attached to the cable end of the Mag Mount Antenna onto the male BNC connector found on the left exterior of the Citation briefcase. Be sure to align the tabs on the male connector with the slots on the female connector for proper operation. Secure the two together by pressing the female connector firmly onto the male connector until it stops, then twist the female connector clockwise until you hear a click. The two connectors are then locked together.
- b.) Locate the antenna whip and make sure the silver screw connector is attached to the bottom of the whip. If it is not, first slide the whip through the hole in the silver screw connector, making sure the threaded portion of the connector is facing away from the antenna after insertion. Then screw the antenna assembly onto the magnetic base by turning the screw connector clockwise onto the base. Hand tighten only. **DO NOT OVER TIGHTEN THE ANTENNA TO THE BASE.**
- c.) Select the External Antenna Operation via the **ANT** selector switch found on the Citation's Control Panel . Observe the condition of the LED indicator above the ANT switch. If the LED is RED, external antenna operation is selected. If the LED is YELLOW, push the switch once to turn the LED to RED and set the unit in External Antenna mode.

FOR INTERNAL ANTENNA:

- a.) Select the Internal Antenna Operation via the **ANT** selector switch found on the Citation's Control Panel . Observe the condition of the LED indicator above the ANT switch. If the LED is YELLOW, internal antenna operation is selected. If the LED is RED, push the switch once to turn the LED to YELLOW and set the unit in Internal Antenna mode.

Your Citation 20 is now ready to either receive a transmission, record a transmission received via the inboard receiver, or playback a prerecorded tape.

RECEIVING TRANSMISSIONS

- 1.) Select the Channel to be monitored - corresponding to the appropriate frequency for compatibility with your transmitter - via the **KEYPAD**.
- 2.) Select the **BANDWIDTH** of the transmission you will be listening to
Select the bandwidth via the **B/W** switch found on the control panel, just to the right of the keypad. This switch toggles the receiver between the new 12.5 kHz channel spacing NTIA-102 extra narrow narrowband standard, and the older 25 kHz channel spacing wider narrowband standard. Each time you press the switch, the LED indicator cycles color from RED to YELLOW. When the LED is RED, the unit is in the NEW 12.5 kHz mode. When the LED is YELLOW, the unit is in the OLD 25 kHz mode.
- 3.) Set the **RECD/PLAY** switch to the RECD (record) position.
This switch toggles the Citation's audio-play system between the reception from the receiver and the playback function of the on-board recorder. Each time you press the switch, the LED indicator cycles color from RED to YELLOW. When the LED is RED, the unit is in the RECORDER PLAYBACK mode. When the LED is YELLOW, the unit is in the MONITOR RECEIVER AND RECORD RECEPTION mode.

4.) Select the operation for the **DSP** switch (**DIGITAL SIGNAL PROCESSOR FILTER - or the Adaptive Digital Audio Filter**)

This switch toggles the Citation's Digital Signal Processor Filter operation between three settings: OFF, 14dB of digital filtering (max. filtering), and 8dB of digital filtering (minimal filtering). Each time you press the switch, the LED indicator cycles color from OFF to RED to YELLOW. When the LED is OFF, the filter is off. When the LED is RED, the filter is in the MINIMAL FILTERING or 8dB setting. When the LED is YELLOW, the filter is in the MAXIMUM FILTERING or 14 dB setting.

This filter can eliminate unwanted backgrounds noise. By using its internal algorithms, the filter detects repeating noises such as receiver white noise, background rumble, etc., and filters them out. The filter processes are NOT recorded by the on-board recorder, however. This retains the integrity of the original reception from the receiver. The filter can be used 'live' during receiver reception, as well as during playback of a prerecorded tape. You should experiment with this filter to see what settings you should use to best fulfill your needs.

5.) Adjust the **VOLUME** control to the center position. Alter the volume to operator preference once transmission has begun.

6.) Adjust the **SQUELCH** control fully to the counter-clockwise position. The noise you hear coming from the audio system is called "White Noise". Turn the squelch control clockwise until this white noise just disappears and the audio system is quiet. This is called the "Critical Squelch" point. Critical Squelch is the optimum point of squelch for the system. Squelch may then be adjusted to the operators preference at any time by turning the control clockwise to increase, or counter-clockwise to decrease the amount of squelch in the circuit.

7.) If receiving transmissions from a scrambled TACTICAL TECHNOLOGIES INC transmitter or repeater, set the **SCR** switch to ON (corresponding LED is ON). If the transmission is not scrambled, set this switch to OFF (LED is OFF).

8.) The Citation will now receive transmissions from your transmitter. Audio will be heard through the internal speaker.

9.) If you prefer private listening, insert a male stereo phone jack from any stereo headphones or earphone into the **EAR** jack. This will disconnect the external speaker. The volume control will now control the audio level in your headphones.

RECORDING TRANSMISSIONS

1.) Complete the steps outlined above for Receiving Transmissions.

2.) Press the **STOP/EJECT** button to open the **CASSETTE TAPE COMPARTMENT**. Insert a BULK ERASED blank cassette into the slot on the compartment lid so that the open edge of the cassette faces up and the full reel of tape is toward the left. Close the cassette compartment lid.

NOTE: TACTICAL TECHNOLOGIES INC. RECOMMENDS USING A BULK ERASED TAPE ANY TIME THE RECEIVER/RECORDING SYSTEM IS IN OPERATION. A BULK ERASED TAPE ASSURES THAT THE CASSETTE BEING USED IN THE OPERATION IS CLEAN AND FREE OF ANY UNWANTED PREVIOUSLY RECORDED MATERIAL, AND WILL ASSIST IN ACHIEVING THE OPTIMUM QUALITY IN RECORDING OPERATIONS. RECORDING QUALITY WILL VARY HOWEVER DUE TO TRANSMISSION AND RECEPTION CONDITIONS.

3.) Set the **TAPE SELECTOR SWITCH** found on the left side of the recorder to match with the type of cassette being used. This selects the proper bias and internal recorder equalization to suit the most common types of cassette tapes.

NORM	normal ferric oxide tapes
CrO2	chromium dioxide and other tapes requiring 70ms EQ and high bias
METAL	metal tapes.

4.) Set the **RECORD LEVEL MODE SELECT SWITCH** on the front panel of the recorder to the "ALC" position.

5.) Set the **TAPE SPEED SELECT SWITCH** on the front panel of the recorder to either the "LOW" or "STANDARD" position. "STANDARD" position will set tape speed to 1 7/8 IPS and will give you 45 minutes of recording time per side from a C-90 cassette tape. The "LOW" position slows down the tape speed to 15/16 IPS and will provide 90 minutes of recording time per side from a C-90 tape.

NOTE: QUALITY OF THE RECORDING MAY DETERIORATE BY USING THE "LOW" TAPE SPEED POSITION.

NOTE: DO NOT CHANGE THE SPEED SELECT SWITCH DURING RECORDING!

6.) The switch settings on the right side of the Marantz Recorder should be set as follows:

- a.) **INPUT SOURCE** : Line
- b.) **AUTO NOISE CANCELLING - ANC**: Normal
- c.) **INTERNAL MIC ATTENUATION**: Any position

7.) If a Marantz 221 is installed in your Citation, the **MONITOR SWITCH** found on the front of the Marantz may be placed in the SOURCE position to monitor the receiver before it is recorded, or the TAPE position to monitor the signal actually recorded on the tape. When the Monitor switch is set to SOURCE, howling may occur. At that time, lower the monitoring volume.

8.) On the Marantz 221, with the **MEMORY REWIND SWITCH** set to the ON position, the tape travel stops when the **TAPE COUNTER** reaches "999". Reset the tape counter via the button found next to the counter.

9.) Press the **RECORD** and **PLAY** buttons on the cassette deck simultaneously.

10.) Your Citation will now record all transmissions from your transmitter.

11.) No record level adjustment is required as long as the REC MODE control on the front panel of the recorder is set to the "ALC" position. Manual operation of the record level is possible by selecting either the "LIMITER" or the "MANUAL" positions.

MANUAL RECORDING LEVEL OPERATION: This mode of operation will permit manual control of the recording level for maximum dynamic range. Set the REC MODE control to the "MANUAL" position. During operation, adjust the **MANUAL RECORD LEVEL CONTROL KNOB** while watching the **VU METER** found on the front panel of the recorder. Ordinarily, the VU meter needle deflection

should be as large as possible. If the VU meter needle stays on the right side of the scale, the level is too high and results in distorted sound. Conversely, if the VU meter needle stays on the left side of the scale, the level is too low and a poor signal to noise ratio will result.

LIMITER RECORDING LEVEL OPERATION: This mode allows manual setting of the recording level while an internal limiter circuit automatically prevents overload distortion resulting from sudden level peaks. Set the REC MODE control to the "LIMITER" position after setting the recording level desired with the control placed in the "MANUAL" position. See section on "MANUAL RECORDING LEVEL OPERATION" for proper procedures.

NOTE: TACTICAL TECHNOLOGIES SUGGESTS THAT ALL RECORDINGS BE MADE WITH THE "REC MODE" CONTROL PLACED IN THE "ALC" POSITION.

- 12.) Use the **PAUSE** key on the cassette deck to temporarily stop the recording. Press it again to resume recording.
- 13.) To end the recording session, press the STOP/EJECT button on the tape deck.
- 14.) If the Citation is equipped with the optional Marantz PMD-650 Mini-Disk Digital tape deck, see the PMD-650 operator's manual for detailed instructions on how to make recording with this system.

PLAYBACK OF PRERECORDED TAPE

1.) Press the STOP/EJECT button on the cassette deck to open the cassette compartment lid. Insert a prerecorded tape into the slot on the compartment lid so that the open edge of the cassette faces up. Close the cassette holding compartment lid on the deck.

NOTE: Be sure to check the setting of the TAPE SELECTOR switch on the left side of the recorder and compare it to the type of cassette you are using.

- 2.) Set the **RECD/PLAY** switch to the "RECORDER PLAYBACK" position (LED is RED).
- 3.) Set the **VOLUME** control to the center position.
- 4.) Set the operation of the **DSP** system.
- 5.) Press the **PLAY** button on the cassette deck.
- 6.) Your Citation will now play back any prerecorded tape through the internal speaker.
- 7.) Adjust the volume control to operator preference once playback has begun.
- 8.) If you prefer private listening, insert the male stereo phone jack from any headphones or earphone into the EAR jack on the Citation's control panel. This will disconnect the external speaker. The volume control will now control the audio level in your headphones.

NOTE: The **Headphones** jack on the front panel of the recorder may also be used for private listening of a prerecorded tape through any stereo headphones. To adjust the volume through this

connection, use the **LEVEL** control on the front panel of the recorder.

9.) Press the STOP/EJECT button to stop the tape.

10.) To scan the tape to find a particular selection, use the **CUE/FAST FORWARD** to fast forward, and the **REVIEW/REWIND** buttons to rewind the tape. Press the STOP/EJECT button to end fast forward or rewind.

11.) The tape deck is equipped with a tape search feature that allows you to scan sections of the tape while the deck is in the play mode by partially depressing either the FAST-F or REWIND buttons. You will hear a loud high-pitched squeal through the audio source if the tape has any thing recorded on it. When the tape reaches a blank section, the squeal stops.

NOTE: TAKE CAUTION IF USING A HEADSET WHILE OPERATING THE TAPE SEARCH FEATURE - MAKE SURE TO ADJUST THE VOLUME DOWN BEFORE PROCEEDING.

12.) The **PITCH** control found on the front panel of the recorder operates only during playback. This control is used to slightly vary tape speed, thus altering the sound of the prerecorded tape. Normal speed is indicated when the PITCH control is set to the center (click) position.

OTHER FEATURES OF THE TAPE DECK

1.) The cassette recorder comes with a tape counter to mark the location of a specific section of tape. Press the reset button on the right to set the counter to 000 at the beginning of the tape. Then, as the tape plays or records, note the counter reading at the point(s) to which you want to return.

2.) *NOTE: IT IS ADVISABLE TO USE A BULK TAPE ERASER TO INSURE PROPER AND COMPLETE ERASING OF ANY AND ALL TAPES PRIOR TO THEIR USE IN THE CITATION.*

3.) Cassettes have a built-in device to automatically prevent erasure of a tape by recording over it. THIS PROTECTION DEVICE, HOWEVER, DOES NOT PREVENT ERASURE USING A BULK TAPE ERASER. The cassette has two small plastic tabs on the back edge. If you break off the Side A tab, you cannot record on Side A. There is a separate tab for Side B. If, however, you later want to record on a side after you have removed the tab, cover the tab hole with a piece of plastic adhesive tape. CAUTION: Never try to force the RECORD key down if you have removed the tab for that side. You can damage the tape mechanism.

4.) Dirt or particles of the tape coating can accumulate on the tape heads and the other parts that the tape touches as it moves. This material can greatly reduce the performance of your unit, so you should clean these parts after every 10 hours of operation.

- a.) Disconnect any external power source that is connected to the Citation, and make sure the PWR switch is in the "OFF" position.
- b.) Press the STOP/EJECT button to open the cassette compartment door.
- c.) Press the PLAY key. The tape head/motion assembly moves forward into view. Use a cotton swab dipped in tape head cleaning fluid or denatured alcohol to clean the parts. Clean both the tape heads, the rubber rolling wheels, and the capstan pin along the rubber wheel. *NOTE: Never touch the front surface of either of the tape heads with any metallic object.*

5.) Tape heads and guides also become magnetized over a period of time and should be

demagnetized periodically using a commercial head demagnetizer.

NOTE: PLEASE REFER TO THE OPERATOR'S MANUAL FOR THE MARANTZ RECORDER FOR FURTHER INFORMATION

REMOVING THE TAPE DECK FOR EXTERNAL USE

The Marantz tape recorder can easily be removed from the Citation 20, allowing it to be used in a variety of other recording needs. It is held down to the control panel via four brackets, one on each side and two in the rear. (For the PDM-650, there are 3 brackets, one on each side and one in the rear).

TO REMOVE THE RECORDER...

- 1.) Turn the Citation 20's POWER switch OFF.
- 2.) Disconnect the three cables leading to the Marantz from the Citation's control panel:
 - a.) **RECORDER POWER CABLE** connected to recorder's **POWER INPUT JACK**.
When this cable is removed from the recorder, it must be inserted into the **RECORDER POWER CABLE HOLDER** grommet .
 - b.) **IN** cable connected to **LINE IN JACK** .
 - c.) **OUT** cable connected to **LINE OUT JACK** .
- 3.) Completely loosen the two screws found on each of the two side brackets attached to the **HOLD DOWN PEGS** on the recorder. Turn the screws counter-clockwise to remove them from the control panel, but do NOT remove the screws from the brackets.
- 4.) Remove the brackets from the recorder by lifting them up slightly, then sliding them off the PEGS.
- 5.) Gently slide recorder towards the front of the Citation. This will release the two rear hold down brackets which were inserted into the **RETAINER SLOTS** . Do not loosen or remove these brackets from the control panel. (For the PMD-650, this single bracket goes over the top of the recorder).
- 7.) Once the recorder has cleared the rear brackets, lift the unit off the control panel.

TO REPLACE THE RECORDER:

- 1.) Align the rear hold down brackets with the RETAINER SLOTS in the recorder and gently slide the tape deck slots over the brackets. (For the PMD-650, slide the tapedeck underneath the bracket.)
- 2.) Replace side brackets onto the recorder's HOLD DOWN PEGS, and screw brackets onto the control panel. Make sure screws line up exactly with the holes in the panel BEFORE you attempt to replace them. Cross threading these screws may cause damage that will not allow the recorder to be held securely to the control panel. Use a small screw driver to tighten the screws down snugly to the control panel.
- 3.) Replace all cables into their correct jacks on the recorder.

USING THE TWO "DIGITAL AUDIO CONTROL" ADJUSTMENTS

These controls peak and/or notch higher and lower audio frequencies so that you may tailor the audio you hear from the receiver or the playback of a prerecorded tape to suit your listening. These digital controls act like a two-band equalizer, and effectively only contour the frequencies that are of the utmost importance in the band of audio frequencies that are utilized by human speech. They are also optimized to be functional within the narrowed audio bandwidth of the NITA-102 standard.

To **FLATTEN** out the audio response from the DAC adjustments, and remove any peaks or notches in the audio frequencies, push the **RIGHT** and/or **LEFT ARROW** switches until both the top and bottom row of LED indicators are in the **CENTER POSITION**. To **PEAK** the upper frequency, repeatedly push the **RIGHT ARROW** switch on the **TOP** control and move the LED indicator to the right of the center position . To **NOTCH** the upper frequency, use the **LEFT ARROW** on the **TOP** control and move the LED indicator to the left of the center position. Repeat this procedure to **PEAK** or **NOTCH** the lower frequency.

LINE OUT

The female RCA/Phone type **LINE out jack** gives an additional line level output from the receiver for use with an external tape recorder, external audio amplifier, equalizer, etc.

RSSI /BATTERY STRENGTH INDICATOR

The **BAT/RSSI (RSSI/BATTERY STRENGTH)** switch and indicator located to the right of the keypad, can supply the user with an RSSI reading (Received Signal Strength Indicator) from an operating transmitter, or it can show the condition of the internal battery inside the Citation.

TO MEASURE RSSI.....

- 1.) Tune the receiver to the operating frequency of a active transmitter.
- 2.) Push the **BAT/RSSI** button until the LED indicator is **RED**.
- 3.) The LED **METER** above the indicator and to the right of the LCD Display will change in color (Red is weakest, Yellow is mid, and Green in the highest quality) and increase in height the stronger the incoming signal is. The weaker the signal, the lower the meter reading will be.

Meter Reading Examples:

Meter @ MID RED	Usable signal - may be slightly noisy.
Meter @ BOTTOM YELLOW	Incoming signal should open the receiver at critical squelch point. Signal is approximately 0.2 microvolts.
Meter @ MID GREEN	Incoming signal should open the receiver at its full squelch point
1.0 microvolts.	(control set fully clockwise). Signal is approximately

The purpose of the RSSI meter is to give a visual indication of how to achieve better reception via receiver antenna configuration and placement. In order to improve signal reception:

- a.) When using the Internal Antenna, rotate the Citation in a circular pattern to increase the

received signal to its best point.

b.) With an External Antenna, physically move the antenna's placement. If the antenna is installed on a vehicle, move the entire vehicle to achieve better RSSI.

It is important to remember that ANY increase in the meter reading, no matter how little, will be a marked improvement in signal strength. The majority of movement in the meter during the course of a normal operation will be between 0.5 and 3 on the meter scale. That relates to approximately a 1 microvolt swing in reception. And every 1/10 of a microvolt increase in signal is a significant improvement. While it is true that the better the signal the more the needle will move toward the right of the scale, the needle does not have to move very far to the right to reflect a change in a signal from one that is "in the mud" and unusable to one that is intelligible, and then to one that is crystal clear.

TO MEASURE THE INTERNAL BATTERY CONDITION...

Press the **BAT/RSSI** switch until the LED indicator is **YELLOW**. The meter scale reflects the following information:

<u>METER READS..</u>	<u>BATTERY VOLTAGE IS..</u>	<u>DESCRIPTION</u>
Bottom RED	Less than 9.7 VDC	Unit in Shut Down Mode
TOP RED	9.7 to 11.5 VDC	Low Battery Condition
YELLOW	11.5 to 13.8 VDC	Normal Operating Range
GREEN	13.8 to 14.4 VDC	Full Charge

CHARGING and CARING FOR THE INTERNAL BATTERY

The Citation 20's internal battery is charging whenever the unit is connected to 110 VAC. The unit will charge with the POWER switch ON or OFF. If the Citation's POWER switch is ON and the unit is operating, the battery will charge at a slower rate than if the POWER switch is OFF. The Citation 20 WILL NOT charge during external 12 VDC operation.

Low battery condition is indicated on the Citation 20 via the RSSI/Battery Condition meter. The meter will read in the RED LED SEGMENTS - or towards the BOTTOM YELLOW SEGMENTS (See the section on the RSSI/Battery Meter for complete meter operating instructions). Once the BAR GRAPH LED begins to turn to the bottom Yellow segments, plan to change your power source to either external 12 VDC or 110 VAC to ensure non-interrupted operation. A fully charged battery will supply an average operating time of 6 hours. Operating time will vary due to the length of time the recorder is in operation.

Once the unit enters a low battery condition, it will continue to operate for at least one hour - then the Citation 20 will shut off completely.

The internal battery must be fully charged immediately once the unit has either entered the low battery condition, or if the unit has shut down due to the battery being fully depleted.

NOTE: IF THE CITATION 20 REACHES THE "SHUT DOWN" POINT, IMMEDIATELY PLUG THE UNIT INTO 110 VAC, TURN THE POWER SWITCH OFF, AND RECHARGE THE BATTERY. IF THE POWER SWITCH STAYS IN THE ON POSITION AND THE CITATION 20 IS

NOT CONNECTED TO 110 VAC, THE UNIT WILL CONTINUE ATTEMPTING TO DRAW A SMALL AMOUNT OF CURRENT OFF THE INTERNAL BATTERY, EVEN THOUGH THE RECEIVER WILL BE NONOPERATIONAL. THIS MAY PERMANENTLY DAMAGE THE INTERNAL BATTERY AND WILL VOID THE UNIT'S WARRANTY.

The internal battery should also be "cycled" at a minimum of once every month. Cycle the battery by allowing the Citation to operate until the BATTERY LED BAR GRAPH begins to turn RED, indicating that the battery is low. Then charge the battery for a minimum of 10 hours. By cycling the battery, you will insure proper operation and increase the battery life.

NOTE: DO NOT CHARGE THE INTERNAL BATTERIES IN THE CITATION 20 FOR MORE THAN 24 HOURS DURING EACH CHARGE CYCLE. CHARGING FOR LONGER THAN 24 HOURS MAY CAUSE DAMAGE TO THE INTERNAL BATTERY.

THE LAMP AND LCD BUTTONS

The LCD button controls the internal light on the LCD display. This switch toggles the internal light ON or OFF.

The LAMP bottom controls the illumination of all the other LED's on the panel. This switch toggles all the panel LEDs (including the Bar Graphs) ON or OFF. The only exception to this is the LED inside the POWER switch. The LAMP switch toggles this LED between VERY BRIGHT and VERY DIM.

OPERATING NOTES:

- 1.) Keep the Citation dry. If it does get wet, wipe it dry immediately. Liquids might contain minerals that can corrode the electronic circuits and cause extensive damage.
- 2.) Handle the Citation with care. Dropping the unit may damage circuit boards, the recorder, and the case, rendering the unit inoperable.
- 3.) It is advisable under extended storage conditions that the Citation's internal battery be allowed to fully discharge down to the low battery indication and then be immediately fully recharged before the Citation is stored again. This procedure should be carried out once every month. Following this system will allow the battery to completely cycle, thus lengthening battery life. The life of the battery may shorten if the Citation is stored for an extended period of time without use. Do not charge the battery for more than 24 hours per charge cycle.
- 4.) Be sure to install the mag-mount antenna base on a metal object when in use. This will allow for proper operation of the antenna system, giving the operator the best possible performance from the receiver.
- 5.) There are no user-serviceable parts in the Citation. If for some reason the unit needs service, please return it to the factory.
- 6.) In cassette recording, the type and brands of cassettes you use have a great influence on the quality of your recordings. Therefore, it is advantageous to purchase the highest quality cassettes available. Chromium dioxide (CrO₂) and metal tapes generally provide better fidelity than normal ferric oxide tapes.

NOTE:

This manual contains excerpts taken directly from the Marantz Model PMD 201/221 Owner's Manual.

Tactical Technologies Inc
1701 Second Ave
PO Box 91
Folsom, Pennsylvania 19033
USA
TEL: 610-522-0106
FAX: 610-522-9430