



North Carolina Department of Public Safety

State Highway Patrol

Roy Cooper, Governor
Eddie M. Buffaloe, Jr., Secretary

Freddy L. Johnson, Jr.
Commander

Support Services
Technical Services Unit

26 September 2022

MEMORANDUM

TO: ALL VIPER USERS

FROM: MICHAEL T. HODGSON, VIPER DIRECTOR

RE: VIPER TDMA PROGRAMMING INFORMATION

Below you will find information to assist you with programming end user radios on the VIPER system in preparation for the system migration to Time Division Multiple Access (TDMA) P25 Phase 2 operation. The deadlines for operational readiness with the TDMA feature **active** in end user radios is rapidly approaching. Those dates are listed below as a reminder;

31 December 2022 – Last day to add a radio to the system that is NOT TDMA ready.

1 January 2023 – All radios added to the system beginning on this date SHALL have TDMA options already activated in the radio.

1 July 2025 – All radios active on the system SHALL be TDMA ready.

Please note that there are NO sites or talk groups currently configured for Phase 2 (TDMA) operation at this time. Further communication will be sent out at such time that we begin to utilize Phase 2 (TDMA) operation on the system.

Should you have any questions regarding the programming information listed below, please direct ALL inquiries via email to: viper-tdma@ncdps.gov. Please understand that if you attempt to enter the programming information into your radio and are unable to do so, or you do not see any fields that resemble those shown, this likely indicates one of the following is true;

- A) You do not have a TDMA capable radio (Phase 1 only radio) ex; XTS/XTL.
- B) You do not have TDMA enabled in the radio (option not purchased). This will require you to contact your **radio vendor** for additional support. Please do not contact VIPER directly.

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The Following channel plan will be in use for VIPER going forward to support the ultimate change to TDMA operation:

Entry #	Channel Type	Base Frequency	Offset Direction	Offset	Channel Spacing
1	FDMA	851.00625	-	45.00000 MHz	6.250 kHz
2	FDMA	762.00625	+	30.00000 MHz	6.250 kHz
3	TDMA	851.01250	-	45.00000 MHz	12.50 kHz
4	TDMA	762.00625	+	30.00000 MHz	12.50 kHz

Below are more specific details for Motorola, JVC-Kenwood/EFJ, Kenwood, and Harris radios

Motorola APX

Under Trunking System, the below Channel plan should be configured as follows:

▼ ASTRO 25 Channel ID						
Position	Identifier Enable	Channel Type	Transmit Offset Sig	Transmit Offset (MH	Channel Spacing (k	Base Frequency (M
Channel ID 1	<input checked="" type="checkbox"/>	FDMA	-	45.00000	6.250	851.00625
Channel ID 2	<input checked="" type="checkbox"/>	FDMA	+	30.00000	6.250	762.00625
Channel ID 3	<input checked="" type="checkbox"/>	TDMA	-	45.00000	12.500	851.01250
Channel ID 4	<input checked="" type="checkbox"/>	TDMA	+	30.00000	12.500	762.00625

Also under the Trunking system, the tick-box for “Phase 2 Voice Capable” must be checked.

▼ ASTRO 25	
Motorola Proprietary Features	<input checked="" type="checkbox"/>
ISP Sequence Length (sec)	5
Maximum Slot Size (ms)	45
Force Unmute Time (ms)	1200
Quick Fade Protect (ms)	300
PTT Warning Time (ms)	750
Busy Update Time (sec)	30
Response Pending Time (sec)	6
Default RCM ID	16777212 - FFFFFC
Phase 2 Voice Capable	<input checked="" type="checkbox"/>
Validate NAC Against System ID	<input checked="" type="checkbox"/>
WUID Validity Support	<input type="checkbox"/>

JVC-Kenwood/EF Johnson Armada

For Armada-based radios (VP Series), the Channel ID list, located under **Systems** -> **“VIPER”** -> **Lists** -> **Channel ID** needs to be configured as shown below.

The screenshot shows the software interface for configuring the Channel ID List. The 'Systems' tab is selected, and the 'Lists' sub-tab is active. The 'Channel ID List' is displayed with the following data:

No.	Channel Type	Tx Offset Sign	Tx Offset (MHz)	Spacing (KHz)	Base Frequency (MHz)
<input checked="" type="checkbox"/> 1	FDMA (12.5 KHz)	-	45.00000	6.25	851.00625
<input checked="" type="checkbox"/> 2	FDMA (12.5 KHz)	+	30.00000	6.25	762.00625
<input checked="" type="checkbox"/> 3	TDMA (6.25 KHz)	-	45.00000	12.50	851.01250
<input checked="" type="checkbox"/> 4	TDMA (6.25 KHz)	+	30.00000	12.50	762.00625

Kenwood KPG-D1N

For Radios programmed with Kenwood KPG-D1N (NX-Series), the Trunked Channel Plan, located under **P25 Network** -> **“VIPER”** -> **Trunked Channel Plan** should be configured as shown below.

The screenshot shows the 'P25 Network - Trunked Channel Plan' configuration screen. The 'Network Number' is 1 and the 'Network Name' is 'VIPER P25'. The table below shows the channel plan configuration:

ID	Base Receive Frequency [MHz]	Base Transmit Frequency [MHz]	Transmit Offset [MHz]	Bandwidth [kHz]	Channel Spacing [kHz]	Channel Type
1	851.006250	806.006250	-45.000000	12.5	6.25	FDMA
2	762.006250	792.006250	+30.000000	12.5	6.25	FDMA
3	851.012500	806.012500	-45.000000	12.5	12.50	TDMA
4	762.006250	792.006250	+30.000000	12.5	12.50	TDMA

Harris RPM2

For Radios programmed with Harris RPM2, the below settings need to be made:

Under Sets, a Channel IDEN set should be created with the following information:

VIPER-XL200-1 > Sets > Default Channel IDEN > VPR TDMA

*Name

Create

#	Incomplete	Base Frequency (MHz)	TX Offset (MHz)	Channel Spacing (kHz)	Bandwidth (kHz)	Type
01		851.00625	-45.0000	6.25	12.500	FDMA Full Rate
02		762.00625	30.0000	6.25	12.500	FDMA Full Rate
03		851.01250	-45.0000	12.5	12.500	TDMA 2 Slot
04		762.00625	30.0000	12.5	12.500	TDMA 2 Slot

Under the P25 system that is defined for VIPER, under the **System Options -> Sets Options -> Default Channel IDEN Set**, the IDEN set created above should be selected.

VIPER-XL200-1 > Systems > P25 Trunked > VIPER

System Options

Sets Options

* Trunked Frequency Set

* Group Set

Phone Call Set

Individual Call Set

* Default Channel IDEN Set

Custom Scan List

Encrypted Data Configuration

Power

Security Key

LCD Display

Control Channel Modulations

Under the P25 system that is defined for VIPER, under Miscellaneous Options, the tick-box for “TDMA Capable” should be enabled.

Miscellaneous Options

<input checked="" type="checkbox"/> Emergency Display	<input checked="" type="checkbox"/> Emergency Audio	<input type="checkbox"/> Send Emergency Alarm	<input type="checkbox"/> Emergency User Only Ctr
<input checked="" type="checkbox"/> Control Channel TX Request	<input type="checkbox"/> VDOC Capable	<input checked="" type="checkbox"/> TDMA Capable	<input type="checkbox"/> HVD-TDMA Capable
<input type="checkbox"/> Vehicular Repeater Activation	<input checked="" type="checkbox"/> Linear Simulcast	<input checked="" type="checkbox"/> Avoid Failsoft	<input type="checkbox"/> Keyback On Ann
<input type="checkbox"/> Confirmed TX	<input type="checkbox"/> Refresh ProScan Adjacency List	<input type="checkbox"/> Adaptive Filter	<input type="checkbox"/> Radio Unit Monitor
<input type="checkbox"/> Prioritize InBand Alias	<input type="checkbox"/> Confirmed Unmute Delay	<input type="checkbox"/> Data Inhibit	<input type="checkbox"/> System Name Toggle With Site Name