

# “The Other Guys”

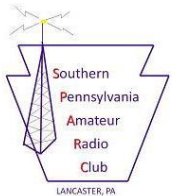
COMPARISON OF PERSONAL RADIO SERVICES

# CBRS

CITIZENS BAND RADIO SERVICE

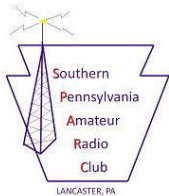
# CB Radio

- 11m HF (26.965-27.405 MHz)
- License by Rule (Anyone)
- AM & FM: 4 W Transmit Power Limit
- SSB: 12 W Transmit Power Limit
- Antenna Limit: 60 Feet AGL & 20 Feet Above Structure
- Amplifiers Not Allowed
- Tones Allowed (Uncommon)



# Link to FCC CBRS Page

<https://www.fcc.gov/wireless/bureau-divisions/mobility-division/citizens-band-radio-service-cbrs>

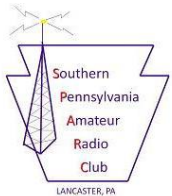


# FRS

FAMILY RADIO SERVICE

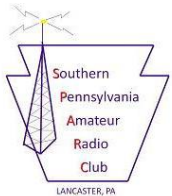
# Family Radio Service

- UHF
- License by Rule (Anyone)
- 22 Channels (Shared w/ GMRS)
- 2 W Transmit Limit (0.5 W on Interstitials)
- Antennas: Non-removable Vertically Polarized Only
- Tones Allowed (Recommended)
- TX Location/Data on GMRS Main Channels



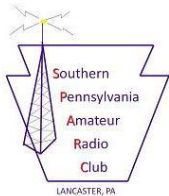
# Best Use of FRS

- Groups of “regular folks” not familiar w/ radio
  - Church
  - School
  - Work
  - Scouts
- **UHF** better for **in-building** or **in-town**
- Find simplest model possible, lock keypad
- Lowest costs



# Link to FCC FRS Page

<https://www.fcc.gov/wireless/bureau-divisions/mobility-division/family-radio-service-frs>



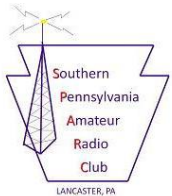


# GMRS

GENERAL MOBILE RADIO SERVICE

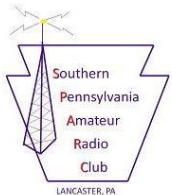
# General Mobile Radio Service

- UHF
- 30 Channels (Some shared w/ FRS)
- Repeaters Allowed, VOIP Networks interconnect
- Antenna: Same regs as Ham (200+ FT FCC Registration)
- Allowed Tones (Recommended)
- Can send Location/Data on Main Channels



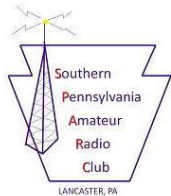
# LICENSE General Mobile Radio Service

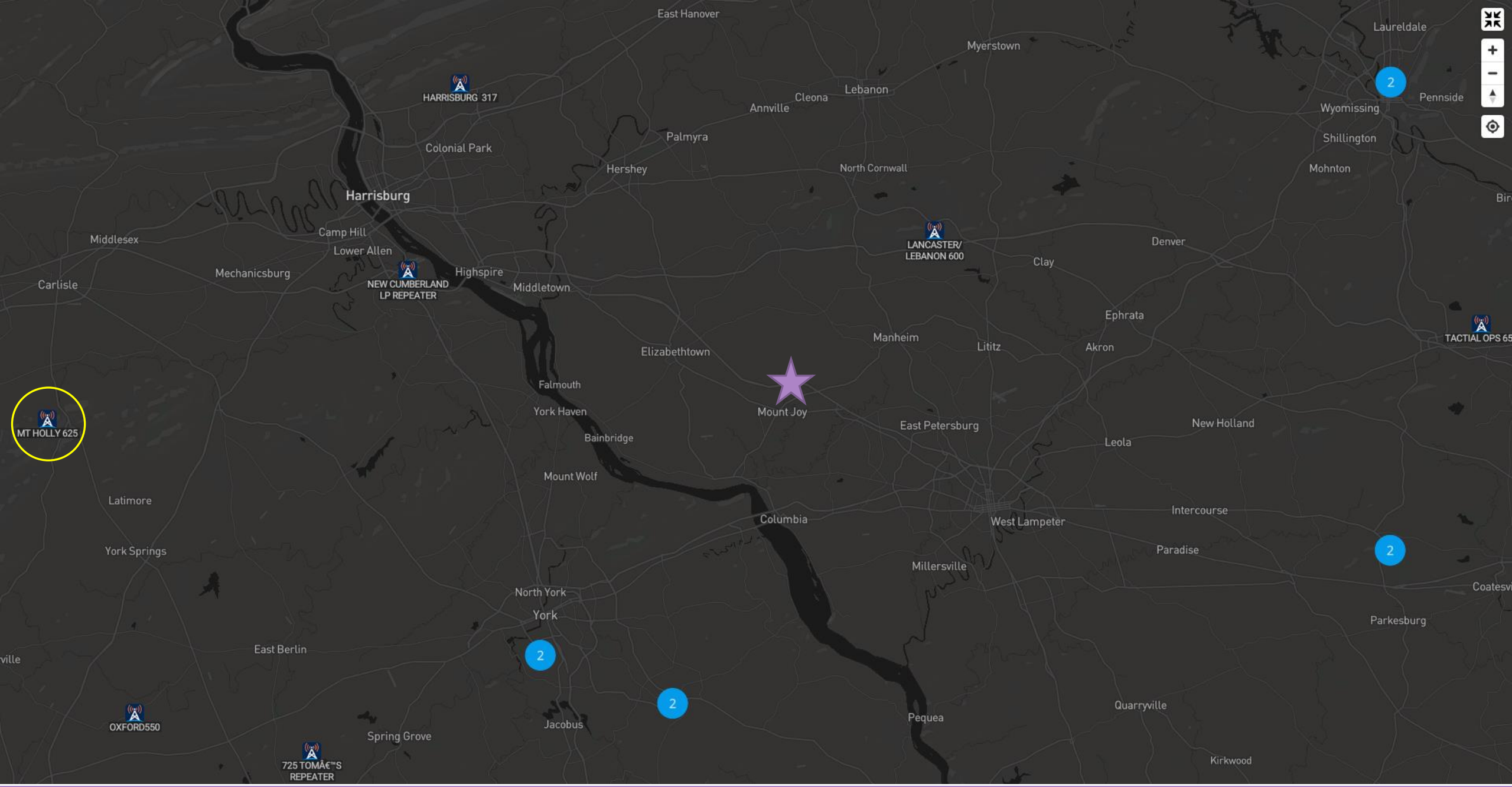
- NO Test
- FCC ULS Like Ham, Requires FRN & Email
- \$35 for 10 years
- License to Individuals Only, Older than 18
  - Person plus Family (any age)
  - No New Business Licenses Issued
- Must ID every 15 minutes



# GMRS Repeater Map

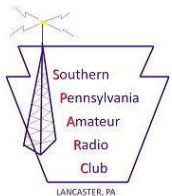
<https://mygmrs.com/>





# Best Use of GMRS

- Fixed group willing to follow radio etiquette
  - CERT / REACT / Neighborhood Watch
  - Hams looking for “family backup” communications
- Can talk to any licensed GMRS user
- UHF maybe better for in-building or in-town
- Same range as ham (repeaters)
- Test repeaters regularly, they change often

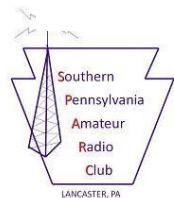
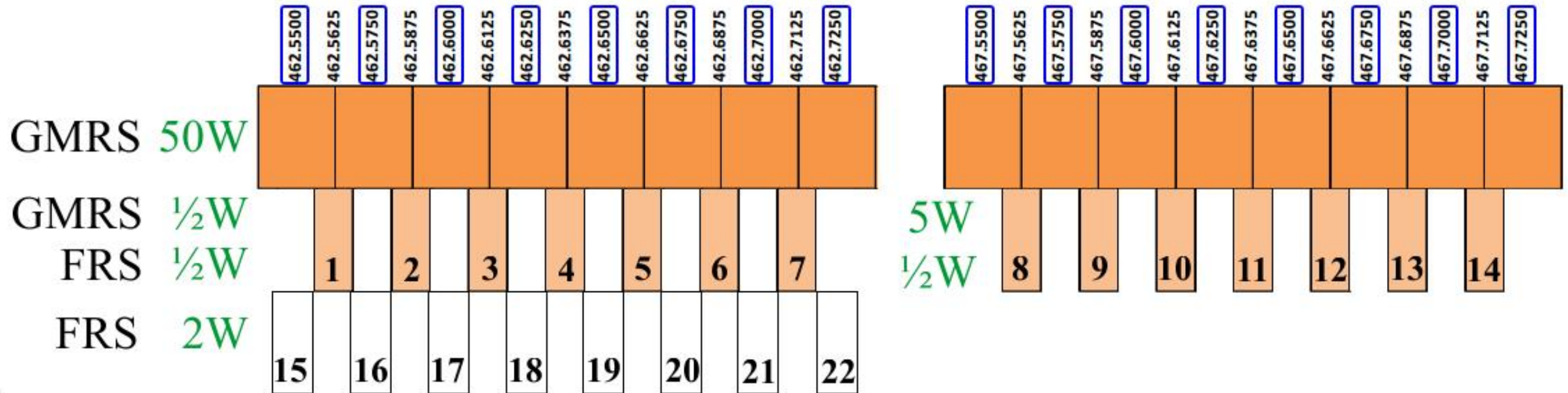


# FRS / GMRS Channels

## New Channel Allotment for GMRS and FRS (Sept 2017)

GMRS Repeater Output Frequencies

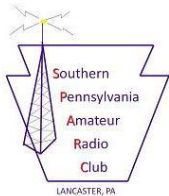
GMRS Repeater Input Frequencies



Graphic by W5ZDN

# Link to FCC GMRS Page

<https://www.fcc.gov/wireless/bureau-divisions/mobility-division/general-mobile-radio-service-gmrs>



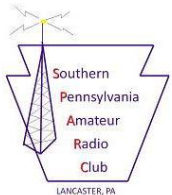


# MURS

MULTI-USE RADIO SERVICE

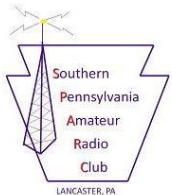
# Multi-Use Radio Service

- VHF
- License by Rule (Anyone)
- 5 Channels
  - Carried over old business radio “Blue Dot” & “Green Dot”
- 2 W Transmit Power Limit
- Can use Tones
- Antenna Limit: 60 Feet AGL & 20 Feet Above Structure



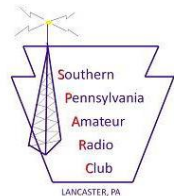
# Best Use of MURS

- Groups of “regular folks” not familiar w/ radio
  - Church
  - School
  - Work
  - Scouts
- **VHF** maybe better for **outside** activities
- Find simplest model possible, lock keypad
- Less common, maybe higher cost



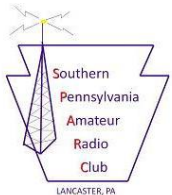
# Link to FCC MURS Page

<https://www.fcc.gov/wireless/bureau-divisions/mobility-division/multi-use-radio-service-murs>



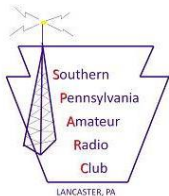
# Ham gear on FRS / GMRS / MURS?

- **Use of gear that isn't "Type Accepted" for a specific radio service is illegal**
- Theoretically? If you program ham gear for a service and operate within all guidelines, it's unlikely that anyone would ever know....
- **WARNING:** Some ham gear requires hardware modification (desoldered jumpers) that voids warranty and can make programming more difficult



# Setting up group FRS... Arcshell AR-5

- **DON'T BUY**
- 6 Radios for \$70
- Program w/ UV5R Cable
- 1,500 mAh Battery
- **Antennas Break @ Base**
- **Battery Latches Crack**



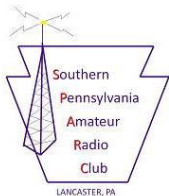
# Setting up group FRS... TIDRADIO TD-66

- 4 Radios for \$60
- Program w/ UV5R Cable
- 1,500 mAh Battery
- Funnicky Charger Base
- Belt clip is weak
- Actually Waterproof
- Survived Scout Camp



# Setting up Group FRS... TIDRADIO TD-777S

- 10 Radios for \$99
- Program w/ UV5R Cable
- USB-C Charging
- 2,200 mAh Battery





# Radio Service Comparison

CRITERIA/ SERVICE	CB	FRS	GMRS	MURS
USE?	By Rule	By Rule	^ Individual License	By Rule
FEE?	\$0	\$0	\$35 / 10 years	\$0
BAND?	HF	UHF	UHF	VHF
FREQUENCIES?	26.965-27.405 MHz	462 & 467 MHz	462 & 467 MHz	151-154 MHz
CHANNELS?	40	22	30	5
FIXED ANTENNA?	NO	YES	NO	NO
ANTENNA HEIGHT?	60 FT AGL 20 FT Above Structure	N/A	~ 200 FT	60 FT AGL 20 FT Above Structure
USE TONE?	YES	YES	YES	YES
REPEATERS?	NO	NO	YES	NO
MUST ID?	NO	NO	15 Minutes	NO
TX POWER LIMIT?	4 W (AM & FM) 12 W (SSB)	0.5 W / 2 W	0.5 W / 5 W / 15 W / 50W	2 W
GPS LOCATION?	NO	* YES	* YES	NO
SHORT MESSAGE?	NO	* YES	* YES	NO
BEST SUITED?	Individual / Mobile or Skip DX	Any Group / Building	Fixed Group / Urban	Any Group / Hiking

^ Single person and immediate family

\* HT Only, 1 second TX every 30 seconds

~ 200+ FT requires FAA registration

