

## REPORT 901-2

**FREQUENCY ASSIGNMENT METHODS FOR TRUNKED  
MOBILE RADIO SYSTEMS**

(Question 37/8)

(1982-1986-1990)

**1. Introduction**

This Report deals with proposals from several administrations on the assignment of channels to trunked systems so as, among other reasons, to reduce intermodulation product interference between systems and within the trunked system itself.

**2. Channel groupings with fixed channel separations**

In this method, used in the 400 MHz band in Canada and in the 800 MHz band in Canada and the United States of America, channels are grouped into blocks and each channel is separated from the others in the block by a fixed number of channels of nominal channel spacing (usually 25 kHz). Consequently each successive channel block is offset by one channel. Sub-blocks can also be identified to provide flexibility in the number of channels assignable to any individual system. Minimum separations between assigned channels within a trunked system are 250 kHz and 100 kHz in the 800 MHz and 400 MHz bands respectively.

Table I gives an example of a channelling plan, used in the United States of America in the 800 MHz band, using a 200-channel allocation. This total allocation of 200 channels could be divided into 10 blocks of 20 channels with 10-channel spacing between frequencies within the block. This arrangement also sub-divides each 20-channel block into 5-channel groups with 40-channel spaces between successive frequencies in each 5-channel group. In addition, these 5-channel groups are arranged into 4 blocks with two 20-channel spacings and one 10-channel spacing between 5-channel groups. This illustration also offsets successive 20-channel blocks by 1 channel to form ten 20-channel blocks.

TABLE I — *Frequency assignment plan for trunked systems in the 800 MHz band in the United States of America*

Block	Channels	Block	Channels
1	1-41-81-121-161 21-61-101-141-181 11-51-91-131-171 31-71-111-151-191	6	6-46-86-126-166 26-66-106-146-186 16-56-96-136-176 36-76-116-156-196
2	2-42-82-122-162 22-62-102-142-182 12-52-92-132-172 32-72-112-152-192	7	7-47-87-127-167 27-67-107-147-187 17-57-97-137-177 37-77-117-157-197
3	3-43-83-123-163 23-63-103-143-183 13-53-93-133-173 33-73-113-153-193	8	8-48-88-128-168 28-68-108-148-188 18-58-98-138-178 38-78-118-158-198
4	4-44-84-124-164 24-64-104-144-184 14-54-94-134-174 34-74-114-154-194	9	9-49-89-129-169 29-69-109-149-189 19-59-99-139-179 39-79-119-159-199
5	5-45-85-125-165 25-65-105-145-185 15-55-95-135-175 35-75-115-155-195	10	10-50-90-130-170 30-70-110-150-190 20-60-100-140-180 40-80-120-160-200

Tables II and III give channelling plans used in Canada for the 800 MHz and 400 MHz bands respectively. Expansion beyond 50 channels would utilize an approach ensuring progressive deployment of trunked systems, while at the same time providing the flexibility of reserving part of the spectrum for future expansion of a given trunked system to multiple blocks of five channels each or the introduction of new technologies that might require different channel bandwidths and channelling plan.

With the methods outlined above, intra-system interference is minimized, in particular since intermodulation products coincide with other frequencies in the same channel block and do not fall in between the channels. The signal from a multi-channel base station on a particular frequency will at any point in the coverage area exceed intermodulation products falling in the same channel, since they result from transmissions from the same base station (but see also Report 739).

TABLE II — *Frequency assignment plan for trunked systems in the 800 MHz band in Canada*

Block	System	Channels
1	1	1 - 11 - 21 - 31 - 41
	2	2 - 12 - 22 - 32 - 42
	3	3 - 13 - 23 - 33 - 43
	4	4 - 14 - 24 - 34 - 44
	5	5 - 15 - 25 - 35 - 45
	6	6 - 16 - 26 - 36 - 46
	7	7 - 17 - 27 - 37 - 47
	8	8 - 18 - 28 - 38 - 48
	9	9 - 19 - 29 - 39 - 49
	10	10 - 20 - 30 - 40 - 50

TABLE III — *Frequency assignment plan for trunked systems in the 400 MHz band in Canada*

System	Channels
1	1 - 5 - 9 - 13 - 17
2	2 - 6 - 10 - 14 - 18
3	3 - 7 - 11 - 15 - 19
4	4 - 8 - 12 - 16 - 20