

DAR Plus FCC LICENSING

At long last, with its Report and Order in November of 2002, the FCC has authorized digital and digital/analog composite radios to operate in the 7 GHz and 13 GHz Auxiliary Broadcast bands. The DAR Plus can be configured as either an analog radio or a digital radio and needs to be licensed accordingly. MRC has created emission designators based on the FCC guidelines. As a result of the new rules, the FCC 601 Form and Schedule I are the only documents needed for licensing. Prior to the recent ruling, a 601, Schedule I and a request for Special Temporary Authorization (STA) were required. This paper will detail how to fill out the 601, now that the FCC Rules allow it.

The 601 Main Form (4-pages)

Upon initial study, the forms, instructions and supporting schedules appear quite menacing and complex. The total document and instructions total 103 pages. One must understand that the 601 is a universal licensing form to be used by many services and for many purposes.

For the Auxiliary Broadcast Microwave Service, only the following sections apply:

Form 601 Instructions (22 pages)

Main Form 601 (4 pages)

Schedule I Instructions (18 pages)

Schedule I Form with supplements (5 pages)

So we are down to 40 pages of instructions and only 9 pages of forms. MRC will take you through each item number of each form that pertains to filling out a DAR Plus license application for digital service.

Main Form 601 Item-by-item entries: Read the instructions (22-pages) for more guidance

Item 1 Radio Service Code – Select the appropriate code from the following list:

TI – TV ICR

TB – TV Microwave Booster

TP – TV Pickup

TS – TV STL

TT – TV Translator Relay

It is likely to be one of the 3 codes highlighted above.

Item 1a Existing Radio Service Code – Select from the same above list if you are changing from one type of radio service to another.

Item 2 Application Purpose – Select only one. It will most likely be **NE – New** or **MD - Modification**

Items 3a through 6 – Self explanatory

Item 7 – Application is considered a major modification if it is a modification of an existing analog license. MRC attempted to convince the FCC to make it just a minor modification but the FCC disagreed.

Item-by-item entries (continued):

Item 8a Does this filing request a Waiver of the Commission’s rules? – Answer “No”

Item 8b Not applicable if no Waiver is requested

Item 9 Answer “Yes” or “No” as appropriate

Items 10 through 34 – Routine Applicant Information

Item 35 Regulatory Status – Check “Broadcast Service” box

Item 36 Type of Radio Service – Check both “Fixed” and “Broadcast Service”

Item 37 Interconnected Service – Answer “Yes” or “No” as appropriate

Items 38 through 52 – Answer or sign as appropriate

FCC 601 Schedule I Item-by-item entries: Read the instructions (18-pages) for more guidance

Administrative Information:

Item 1 – Answer appropriately “Yes” or “No”

Items 2a and 2b – Answer if applicable

Item 3 Type of Operation – Check “Permanent Fixed Point to Point”

Item 4 Station Class – Select “FXO” from the following:

Fixed – FXO

Temporary Fixed – FX5

Mobile – MO

Mobile & Temporary Fixed – MO5

Item 5 – Not Applicable

Item 6 – Answer “Yes” or “No” as appropriate

Item 7 Frequency Coordination – For new station applications, formal PCN is now required through a professional coordination service such as Comsearch, Spectrum Planning, Consolidated Spectrum Services, etc. However, if this is an update of an existing analog license and your area has a volunteer SBE authorized coordinator, contact the coordinator before filing to see if he or she is aware of any similar applications being granted without needing a formal PCN.

Items 8 through 11 – Self-coordination is no longer allowed unless the situation discussed under Item 7 applies. Fill in using the information supplied from your frequency coordination service.

Item-by-item entries (continued):

Items 12 and 13 – Fill in if appropriate

Items 14 through 16 Technical Point of Contact – Indicate “A” (add) or “M” (modify) as appropriate and fill in the location and telephone number information.

FCC 601 Schedule I Supplement 1 – Location Data

The FCC ruling has not changed this section.

FCC 601 Schedule I Supplement 2 – Path Data

The FCC ruling has not changed this section.

FCC 601 Schedule I Supplement 3 – Passive Repeater Data

The FCC ruling has not changed this section.

FCC 601 Schedule I Supplement 4 – Frequency Data

This page contains the crux of the changes brought about by the FCC rulemaking. The DAR Plus radio can be set up either as an analog or digital radio.

Item 1 Transmit Location Name – Fill in as before

Item 2 Path Number – Fill in as before. Use additional sheets when applying for multiple paths.

Item 3 Frequency Information – Fill in as follows for each transmitter on each path:

Action – A/M/D (Add, Modify, Delete)

Item 4 Lower or Center Frequency (MHz) – For 7 GHz and 13 GHz BAS applications, use the Center Frequency. For example, 7 GHz channel 3 (B3) has, as its band edges, 6925 and 6950 MHz. Although it can be defined by its band edges, the FCC prefers to use its Center Frequency, which is 6937.5 MHz. This should be entered in the Item 4 box. To avoid confusion, it is recommended that the words “Lower or” be crossed out.

Item 5 Upper Frequency (MHz) – Put in “NA” (not applicable).

Item 6 Tolerance (%) – Fill in “+/- 0.0005”

Item 7 EIRP (dBm) – This is the effective isotropic radiated power (rounded to one decimal place) radiated off the transmitting antenna and expressed in dBm (dB above 1 milliwatt). Refer to the DAR Plus Data Sheet for the power output in the desired frequency band and in the desired type of service. For example, a standard power 7 GHz DAR Plus transmitter has a +33 dBm (2-watt) analog output. If filing for a high power transmitter, the number is +37 dBm (5-watts). If you are filing for a digital DAR Plus, the standard power output in the 7 GHz band is +28 dBm and for the high power version, it is +31 dBm.

Starting with the transmitter output power, subtract all losses between it and the antenna. Do the entire math in either dBms and dBs. Here is an example:

Item-by-item entries (continued):

Transmit power is 2 watts (+33 dBm). Channel Filter Loss is 1.5 dB. Multiplexing (or branching) loss is 0.9 dB. Waveguide loss for 100 feet of EW63 is 1.3 dB. At the antenna, the power level is 33-1.5-0.9-1.3 or +29.3 dBm. Now add the antenna gain. For a 6.4-7.1 GHz 8-foot antenna, its gain is 42.4 dB at mid-band. Lastly, subtract the radome loss if one is used. For a standard unheated radome, its loss at 7 GHz is 0.8 dB. So the net gain of the antenna is 41.6 dB (42.4-0.8). That number added to +29.3 dBm gives a final EIRP of +70.9 dBm. This could also be expressed in decibels above 1 watt. That number would be +40.9 dBw.

Item 8 Emission Designator – For analog service in the 7 or 13 GHz band, the correct entry for the DAR Plus is **25M0F9W**. For digital service in those same bands, the correct entry for the DAR Plus is **25M0D7W**.

Items 9 and 10 – Not Applicable for analog service.

For digital service, enter the baseband data rate as expressed in kbps. For example, a DS3 signal operates at approximately 45 Mbps. Enter “**45000**” in Column 9. Enter the digital modulation type in Column 10. If the DAR Plus is used in conjunction with the MRC Variable Rate Modem (VRM), the modulation type can be selected. The most common types are 16QAM, 32QAM and 64QAM. For the planned service, enter the modulation type in Column 10.

Item 11 Transmitter Manufacturer – Enter **Microwave Radio Communications**

Item 12 Transmitter Model – Enter **DAR Plus**

Item 13 Automatic Transmitter Power Control – Enter “**No**”