

TWINSTREAM 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. They have categorized the TwinStream radio as an “composite” analog radio for licensing purposes. MRC has created an emission designator based on the FCC guidelines. Now, 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 TwinStream license application.

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

Item 1 Radio Service Code – Select TS from the following:

TI – TV ICR

TB – TV Microwave Booster

TP – TV Pickup

TS – TV STL

TT – TV Translator Relay

Item 1a Existing Radio Service Code – Select from the above list if applicable

Item 2 Application Purpose – Select only one

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 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

Item-by-item entries (continued):

Items 10 through 34 – Routine Applicant Information

Item 35 Regulatory Status – Check Broadcast Service box

Item 36 Type of Radio Service – Check Broadcast Service and any others that apply

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.

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.

Item-by-item entries (continued):

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. By its own definition, the FCC has classified the TwinStream radio as a composite analog radio. This is because 50% or more of the occupied bandwidth contains the analog signal. It is also the primary contributor of power by a significant margin.

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 TwinStream Data Sheet for the power output of the analog carrier. For example, a standard power 7 GHz TwinStream transmitter has a +33 dBm (2-watt) analog output. If filing for a high power transmitter, the number is +37 dBm (5-watts). Do the entire math in dBms and dBs. Starting with the transmitter output power, subtract all losses between it and the antenna. Here is an example:

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-by-item entries (continued):

Item 8 Emission Designator – The correct entry for the TwinStream is **25M0F9W**.

Items 9 and 10 – Not Applicable

Item 11 Transmitter Manufacturer – Enter Microwave Radio Communications

Item 12 Transmitter Model – Enter TwinStream

Item 13 Automatic Transmitter Power Control – Enter No