Subject FCCID: ARUSRV50B (Correspondence ID: 3687)

In response to your request for additional data via email on Friday, September 25, 1998, answers are provided below using the same item numbers and order.

1.   Yes, the power is indeed variable from 10 to 50 watts. The conducted spurious were measured at the reduced power levels. The results of these measurements are shown in the file ARUSRV50B_add2.xls. The data was measured at the low end, middle, and high end of the band. In addition the radiated powers were all below the radiated levels measured for the 50 watt level although data was not taken. The modulation section was not affected by the power adjustment nor was the occupied bandwidth.

2.   The F3D designators applied for in our application do not meet 90.203 efficiency requirements. Please remove from our application.

3.   Bandwidth calculations for requested emissions….

    16K0F3E
    FM Voice   Maximum Deviation = 5 kHz
                      Maximum modulating frequency = 3 kHz (Voice)

                      BW = 2 * 5 kHz + 2 * 3 kHz = 16.0 kHz or 16K0

    16K0F9W
    FM Voice with sub-audible data
                      Voice 4.25 kHz Deviation
                      3 kHz Maximum modulation frequency

                      Data   0.75 kHz Deviation
                      .300 kHz Data rate

    BW = 2*3 + 2* (4.25 + .75) *1 = 16KHz or 16K0

    11K0F3E
    FM Voice   Maximum Deviation = 2.5 kHz
                      Maximum modulating frequency = 3 kHz (Voice)

                      BW = 2 * 2.5 kHz + 2 * 3 kHz = 11.0 kHz or 11K0

    11K0F9W
    FM Voice with sub-audible data
                      Voice 2.0 kHz Deviation
                      3 kHz Maximum modulation frequency

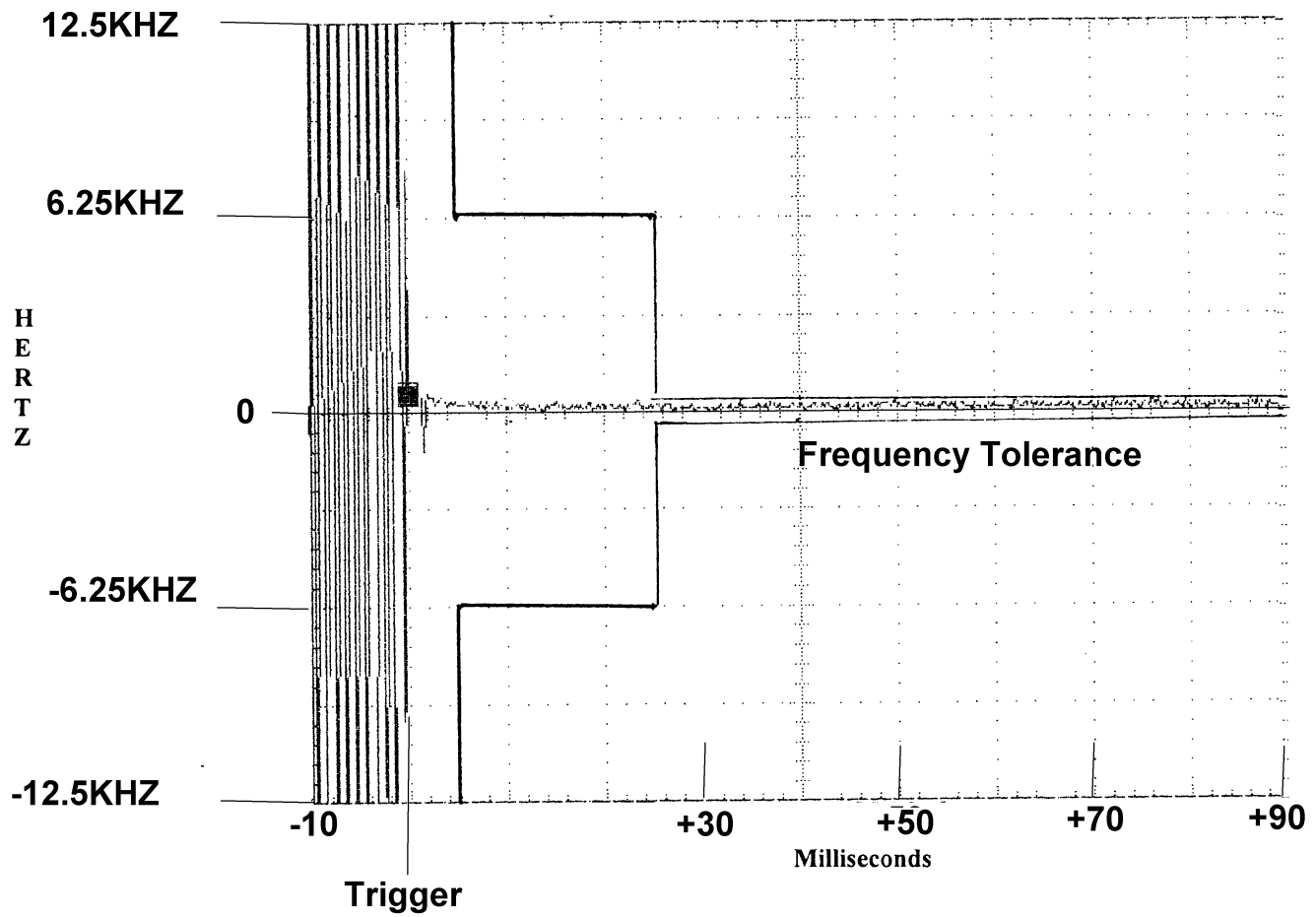   Data   0.5 kHz Deviation
                      .300 kHz Data rate

    BW = 2*3 + 2* (2.0 + 0.5) *1 = 11KHz or 11K0

4.   Modulation limiting for operation in the narrow band mode (12.5 kHz channel spacing) is shown in the Excel file ARUSRV50B_add2.xls in 'sheet 1'.

5.   The new charts are shown below. Data was also taken showing the slight difference between VCO 'ON' and VCO 'OFF'

12.5 kHz Channel Bandwidth,   Start of Transmission Characteristics with VCO 'ON'
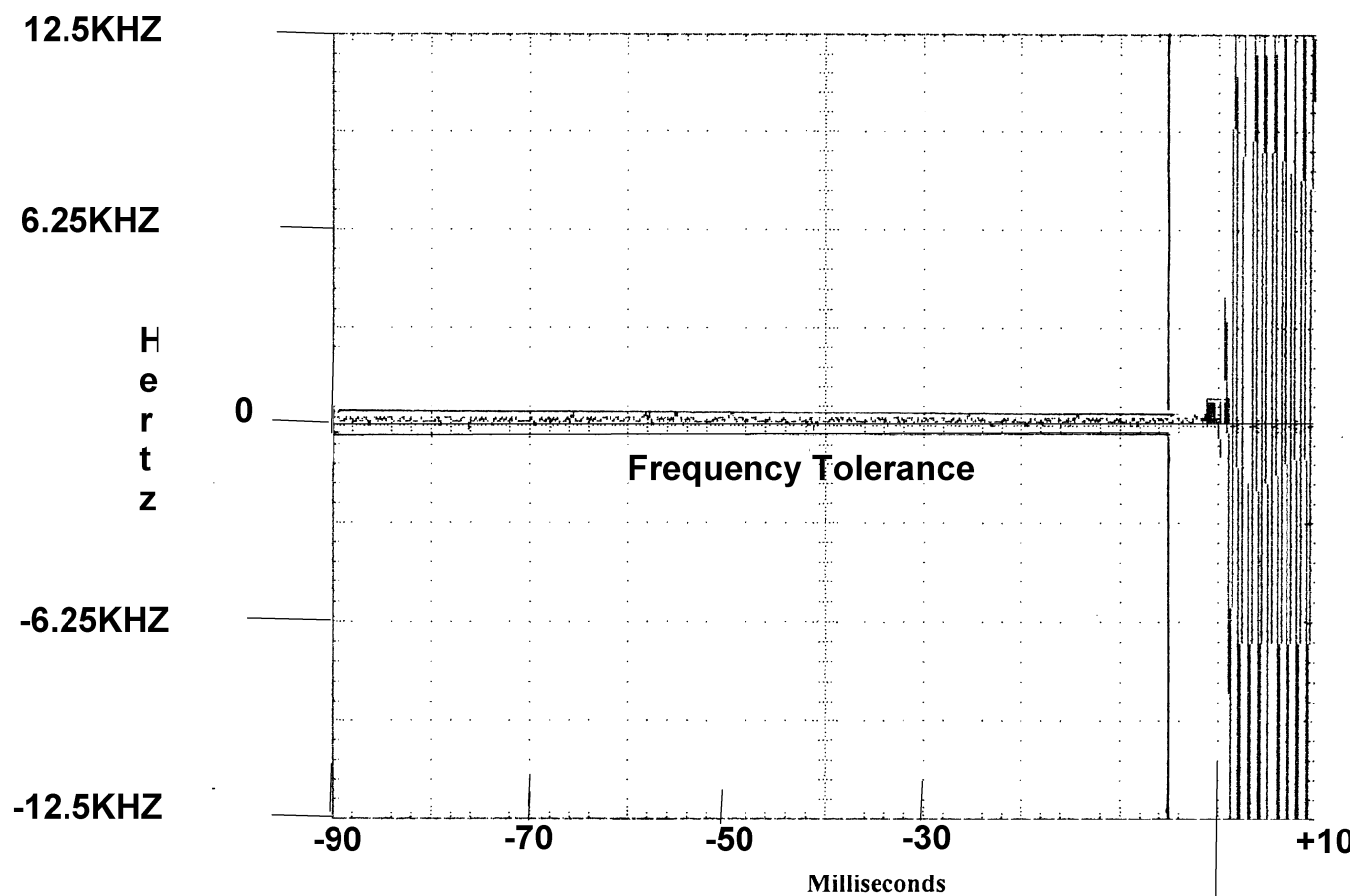

Transient Behavior "VCO" ON   151.025 MHz
ARUSRV50B 12.5KHz
Turn On Condition

Tested by:Kenneth Klyberg-Engineering Tech

12.5 kHz Channel Bandwidth,   End of Transmission Characteristics with VCO 'ON'

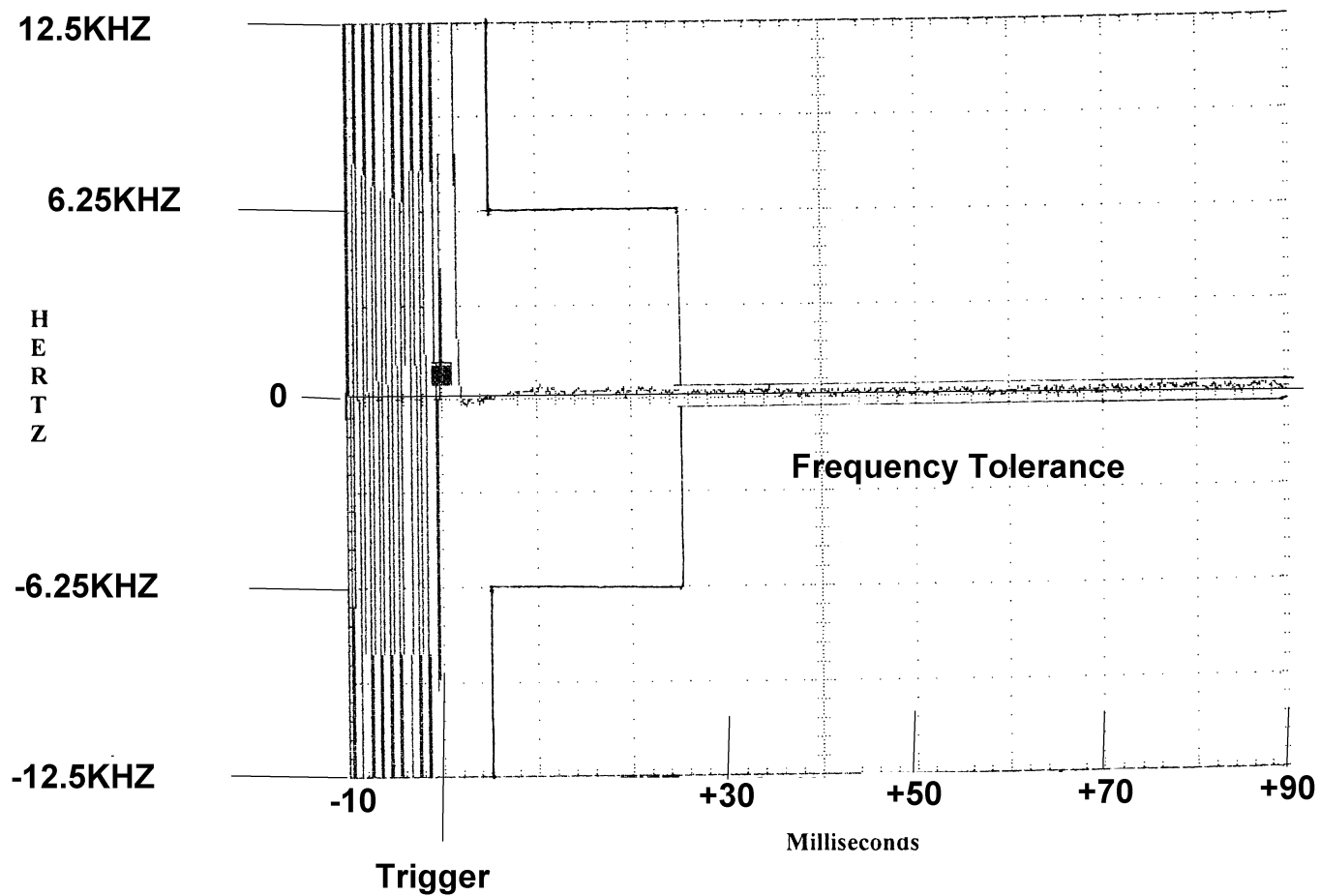Transient Behavior "VCO" ON   151.025 MHz   **Trigger**
ARUSRV50B   12.5KHz
Turn Off Condition

Tested by:Kenneth Klyberg-Engineering Tech

12.5 kHz Channel Bandwidth,   Start of Transmission Characteristics with VCO 'OFF'

```
12.5KHZ  ─┐

 6.25KHZ  ─┤

H
E
R      0  ─┤            Frequency Tolerance
T
Z

-6.25KHZ  ─┤

-12.5KHZ  ─┴──────────────────────────────────────────
              -10        +30      +50      +70      +90
                              Milliseconds
         Trigger
```

Transient Behavior "VCO" OFF   151.025 MHz
ARUSRV50B 12.5KHz
Turn On Condition

Tested by:Kenneth Klyberg-Engineering Tech

12.5 kHz Channel Bandwidth, End of Transmission Characteristics with VCO 'OFF'
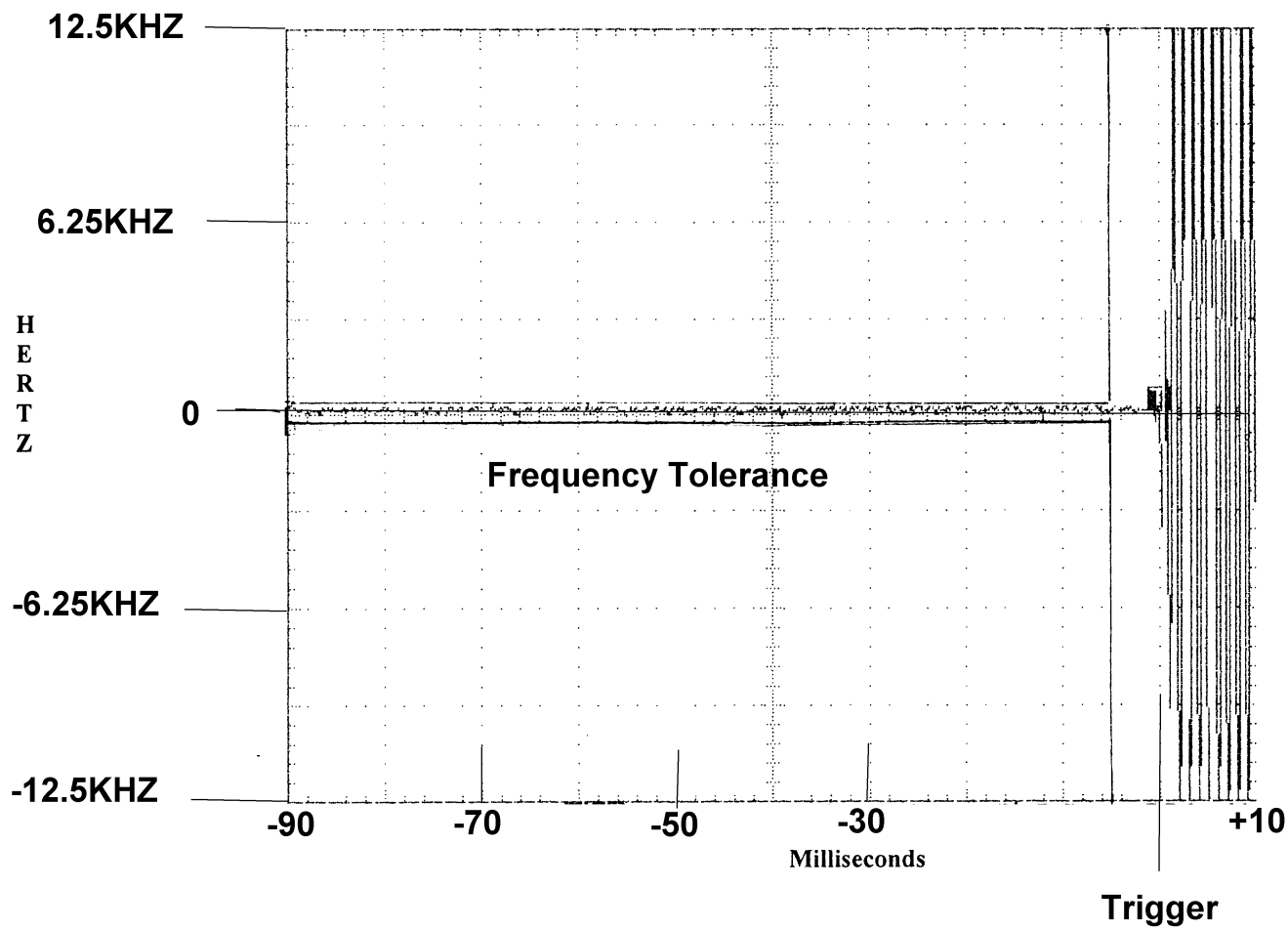

Frequency Tolerance

Milliseconds

Trigger
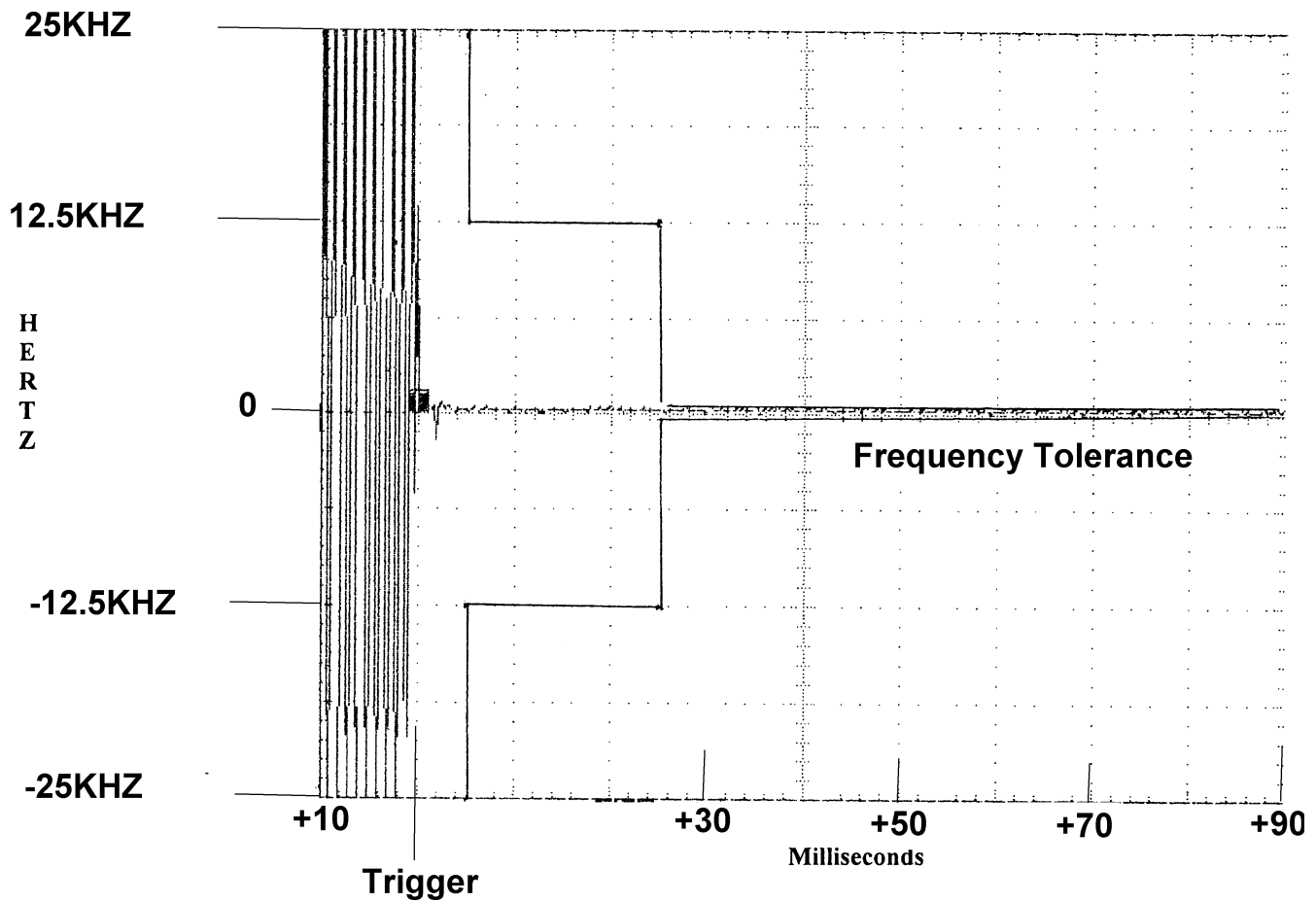
Transient Behavior "VCO" OFF   151.025 MHz
ARUSRV50B 12.5KHz
Turn Off Condition

Tested by: Kenneth Klyberg-Engineering Tech

25 kHz Channel Bandwidth,   Start of Transmission Characteristics with VCO 'ON'

25KHZ

12.5KHZ

H
E
R
T
Z

0

Frequency Tolerance

-12.5KHZ

-25KHZ

+10   +30   +50   +70   +90

Milliseconds

Trigger

Transient Behavior "VCO" ON   151.025 MHz
ARUSRV50B   25 KHz
Turn On Condition

Tested by:Kenneth Klyberg-Engineering Tech

25KHZ

12.5KHZ

H
E
R   0
T
Z

Frequency Tolerance

-12.5KHZ

-25KHZ

-90   -70   -50   -30   +10

Milliseconds

Trigger

Transient Behavior "VCO" ON   151.025 MHz

ARUSRV50B 25 KHz
Turn Off Condition

Tested by: Kenneth Klyberg-Engineering Tech
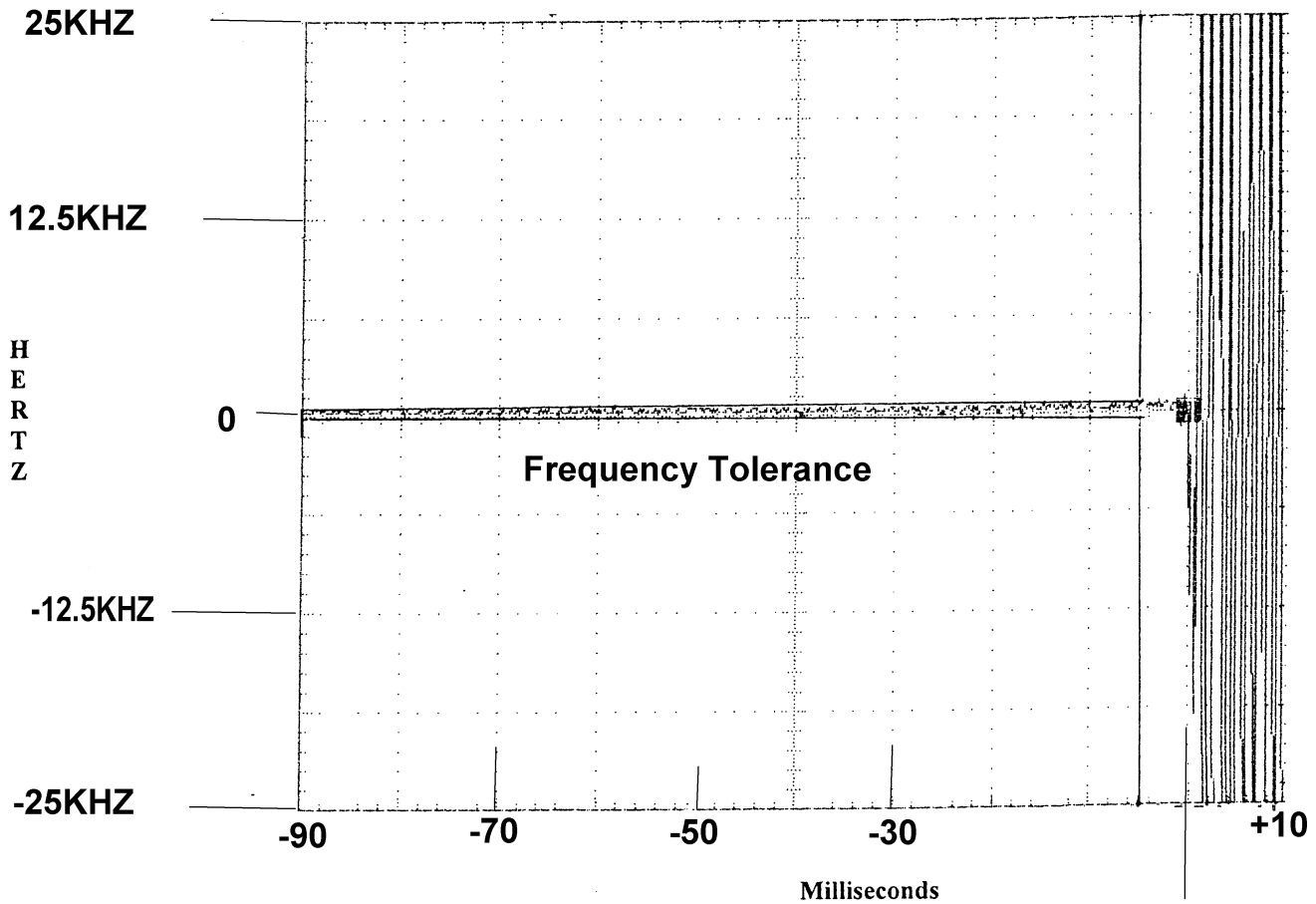
Transient Behavior "VCO" OFF   151.025 MHz
ARUSRV50B   25 KHz
   Turn On Condition

Tested by:Kenneth Klyberg-Engineering Tech

Transient Behavior "VCO" OFF   151.025 MHz

ARUSRV50B   25 KHz
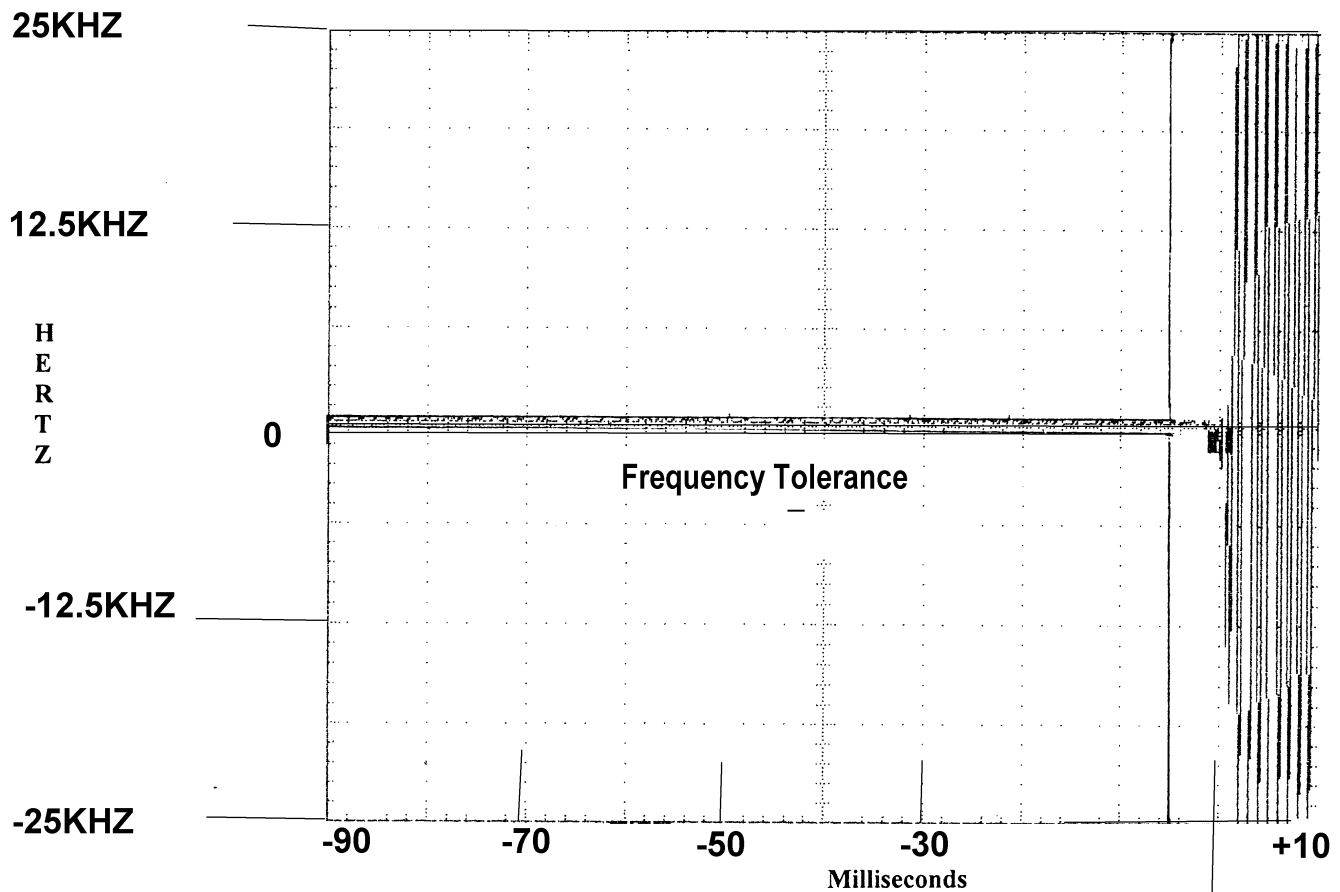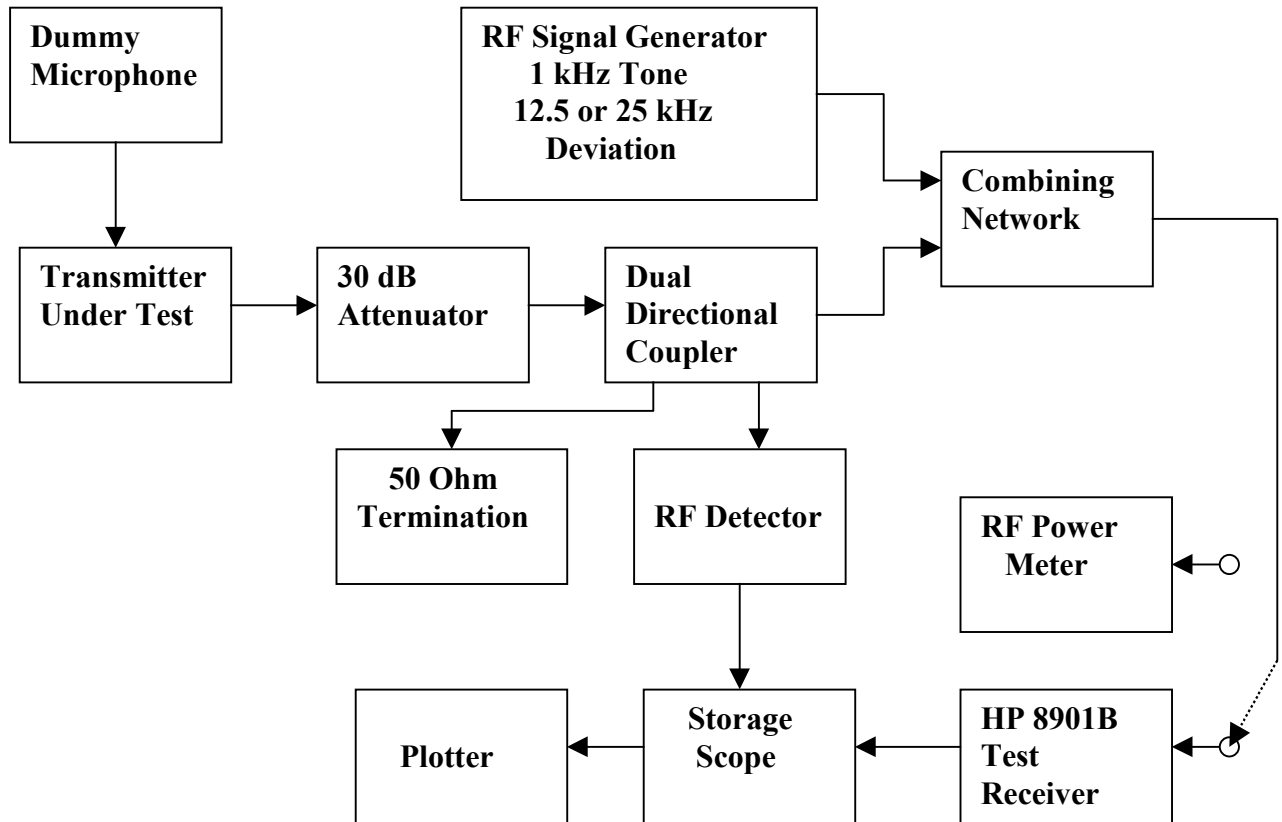**Turn Off Condition**

Tested by:Kenneth Klyberg-Engineering Tech

6. The transient frequency behavior test was performed according to TIA/EIA-603. The block diagram is shown below.

```
┌──────────────┐          ┌──────────────────┐
│   Dummy      │          │ RF Signal Generator│
│  Microphone  │          │    1 kHz Tone      │        ┌──────────────┐
└──────┬───────┘          │   12.5 or 25 kHz   │───┐    │  Combining   │
       │                  │     Deviation      │   │    │   Network    │
       │                  └──────────┬─────────┘   │    └──────────────┘
       ▼                             │             │
┌──────────────┐  ┌──────────┐  ┌────┴──────┐  ┌──▶│
│ Transmitter  │  │  30 dB   │  │   Dual    │  │
│ Under Test   │─▶│Attenuator│─▶│Directional│──┤
└──────────────┘  └──────────┘  │  Coupler  │──┘
                                └─────┬─────┘
            ┌──────────────┐   ┌──────────────┐        ┌──────────────┐
            │   50 Ohm     │   │              │        │  RF Power    │
            │ Termination  │   │ RF Detector  │        │    Meter     │───○
            └──────────────┘   └──────┬───────┘        └──────────────┘
                                      │
┌──────────┐   ┌──────────────┐   ┌──────────────┐
│ Plotter  │◀──│   Storage    │◀──│  HP 8901B    │◀──○
│          │   │    Scope     │   │    Test      │
└──────────┘   └──────────────┘   │   Receiver   │
                                  └──────────────┘
```

It should be noted that this equipment can have the transmitter PLL 'ON' continuously. The leakage is very low and the radiated tests were done with it powered and locked. As such, the transient lock for this equipment with the PLL 'ON' appears like nothing is happening. The unit was measured with PLL 'ON' and 'OFF' although it is recommended to the user the run the equipment with the PLL 'ON'

In the above block diagram, the RF signal generator is adjusted 20 dB below the signal from the Transmitter Under Test and the Test Receiver is fixed tuned to minimize any time delay in recovering the transient signal. This RF signal generator serves to provide a calibration to the transient display on the output of the test receiver. The use of a digital storage scope, however, causes aliasing to the calibration 1 kHz tone. Prior to plotting the screen, the scope was calibrated using the 1 kHz audio output of the test receiver (12.5 or 25 kHz deviation) for the full 8 cm display.

7. Data for item 90.214 for the narrow bandwidth channel is shown above in item four along with better labeled charts for the wide bandwidth channels.

8. Thank you.

Walter C. Simcoat

Engineering Manager