BROADCAST PRODUCTS, INC.

April 18, 2000

Federal Communications Commission
Equipment Approval Services
P.O. Box 358315
Pittsburgh, PA 15251-5315

Gentlemen:

EMCEE Broadcast Products requests certification of the Model TUA100FA 100 Watt UHF Power Amplifier in accordance with Part 74, Subpart G of the Commission's Rules and Regulations.

Enclosed is a copy of the EMCEE engineering report describing the equipment and test procedures utilized to confirm compliance with the regulations applicable to Low Power Television, Television Translator and TV Booster Stations. Also included is the TUA100FA Amplifier instruction manual which contains the required circuit descriptions, alignment procedures, and technical specifications. A check in the amount of $475 to cover the filing fee is also enclosed.

If any further information is required to expedite this application, please feel free to call me at 570-443-9575 or 800-233-6193.

Sincerely,

Robert G. Nash
VP/Director of Engineering

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# Certification Submission for the Model TUA100FA 100 Watt UHF Power Amplifier per Part 74, Subpart G, of the FCC Rules and Regulations


EMCEE Broadcast Products
PO Box 68
White Haven, PA 18661-0068

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# SECTION I

## 1.0 INTRODUCTION

## 1.1 General

This report contains data required for certification of the EMCEE Model TUA100FA UHF Television Power Amplifier. This amplifier, which will be manufactured in quantity, is intended for use with any type accepted 20 watt LPTV transmitter or 20 watt translator, particularly the EMCEE Models TTU20F and TU20F. Using two parallel LDMOS power transistors in a single amplifier module, the TUA100FA is rated to provide 100 watts peak visual and 10 watts average aural power on any specified UHF channel extending from 470MHz to 806MHz. The data contained in this report was obtained from tests performed on an EMCEE production unit having an output frequency of UHF channel 65 (776-782MHz) using a TTU20F LPTV Transmitter as its 20 watt driver. A complete list of the test equipment utilized to obtain the certification data can be found in Section 1.3 of this report. Information relating to the description, operation and maintenance of the amplifier can be found in the TUA100FA Instruction Manual. Information concerning the TTU20F transmitter, including modulators, may be found in its previously submitted type acceptance report (BMTTTU20F Grant 1/22/96).

## 1.2 Personnel Qualifications

The certification tests were conducted under the supervision of Robert Nash, EMCEE VP/Director of Engineering. Mr. Nash has 23 years of experience in the development and testing of television transmitters and translators.

## 1.3 Test Equipment

1. Antenna, Adjustable Dipole Set, 30MHz-1GHz, Model 3121, EMCO
2. Antenna, Conical Helix, 1-11GHz, Model ALN108B, AEL
3. Attenuator, 10dB, Model 766-10, Narda
4. Attenuator, 20dB, Model 766-20, Narda
5. Attenuator, 30dB, Model 766-30, Narda
6. Attenuator, 30dB, 150W, Model 769-30, Narda
7. Distortion Measurement Set, Model 339A, Hewlett Packard
8. Demodulator, Model 1450, Tektronix
9. Directional Coupler, 30dB, Model 3001-30, Narda

10. Diode Detector, 50 ohm, Model 8553, Telonic Berkeley

11. Envelope Delay Measuring Set, Model 201/1, Shibasoku

12. Mixer, Model ZAD-2, Mini-Circuits

13. Modulator, Model EM1, EMCEE

14. Multimeter, Digital, Model E2378A, Hewlett Packard

15. NTSC Vectorscope, Model 520, Tektronix

16. NTSC Video Generator, Type 149A, Tektronix

17. Power Meter, Model 435A, Hewlett Packard

18. Spectrum Analyzer, Model 8594E, Hewlett Packard

19. Waveform Monitor, Model 1485R, Tektronix

20. 20 Watt LPTV Transmitter, Model TTU20F, EMCEE

21. 100 Watt Power Amplifier, Model TUA100FA, EMCEE

## 1.4 Active Device List

The following is a complete listing of all the active devices used in the EMCEE Model TUA100FA UHF Power Amplifier. The devices are grouped together as seen on each specific schematic or interconnection diagram. Given with each device is its schematic designator, EMCEE part number and function.

| DEVICE | PART #/DESIGNATOR | FUNCTION |
|---|---|---|
| 100 Watt UHF Amplifier<br>Schematic Diagram 40383163 | | |
| Integrated Circuit | MC1723CD/U1 | Current Regulator |
| Transistor | PTF10159/Q1, Q2 | RF Amplifier |

## 1.5 Certification of Data

Having supervised the tests and compilation of information in this report, I certify that all statements and test results submitted for certification of the EMCEE TUA100FA are true and correct to the best of my knowledge.

Robert G. Nash
VP/Director of Engineering

# SECTION II
# TEST PROCEDURES AND DATA

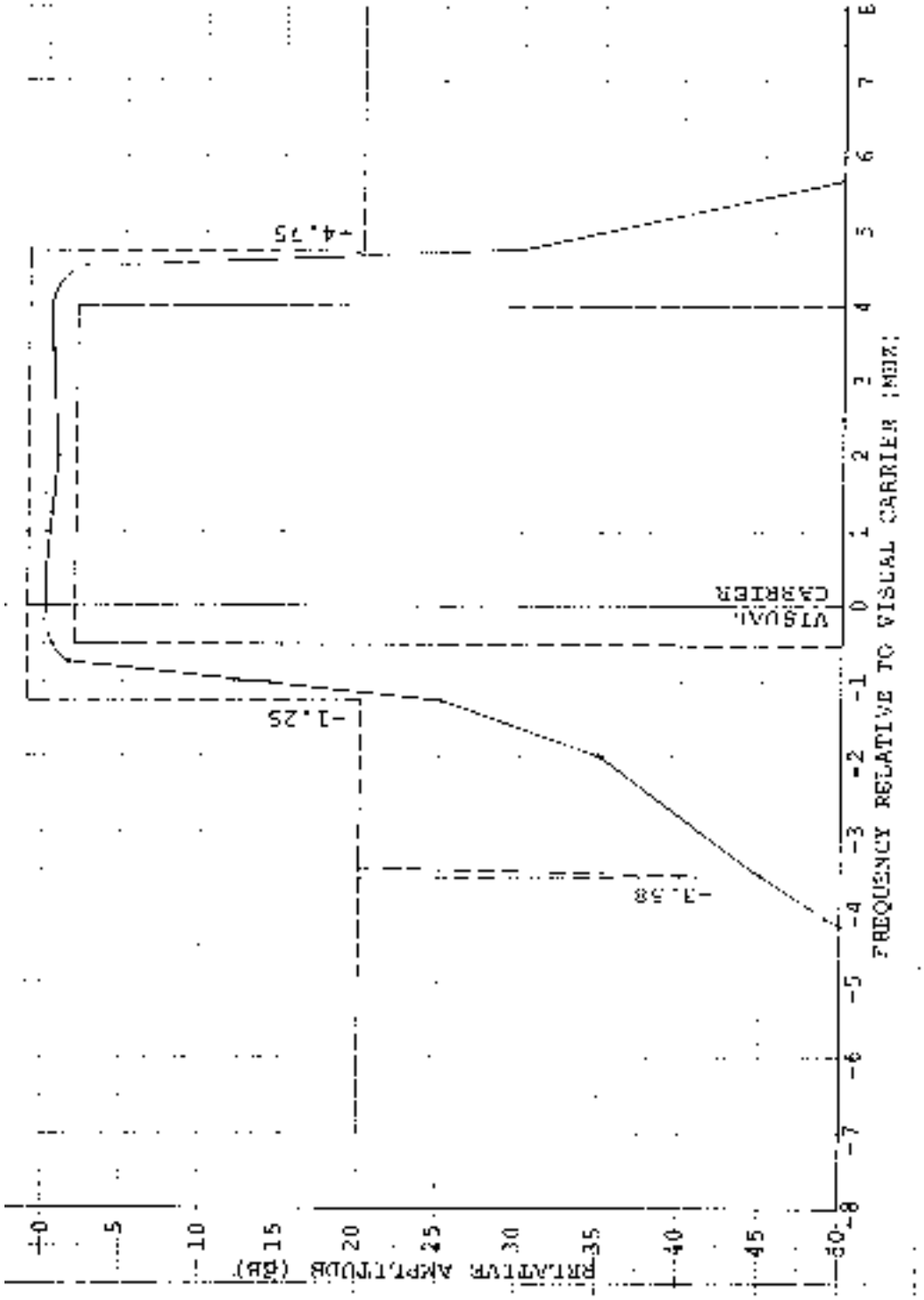
## 2.1 Frequency Response [73.687(a)(1)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–1A |
| Visual Output Power | 100 watts peak sync |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard sync with a variable frequency sine wave occupying the interval between pulses. Sine-wave axis was maintained at 50% of the peak sync amplitude. Sine-wave amplitude was held constant at less than 75% of the peak output voltage. |
| Aural Output Power | 0 watts |
| Method of Measurement | Sine-wave frequency was varied through the video range. The data recorded was relative to the 200kHz sideband amplitude designated as 0dB. |

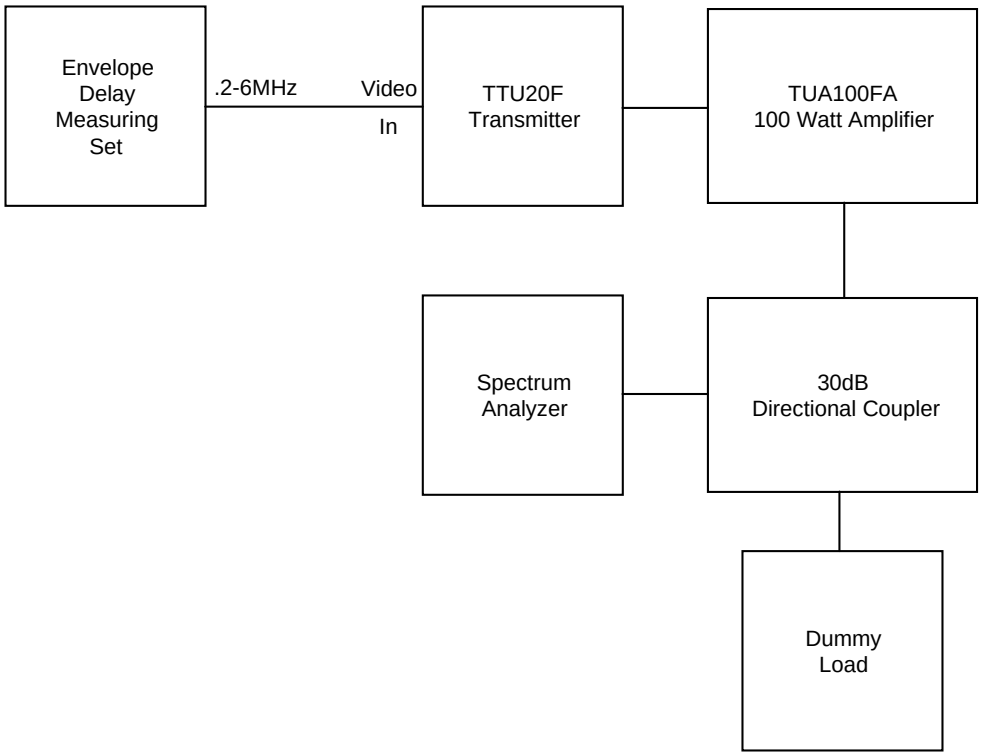
Frequency Response Data

REFERENCE LEVEL: 0dB = 200kHz sideband amplitude

| Output Freq. (MHz) Channel 65 | Sidebands | Relative Output (dB) Channel 65 |
|---|---|---|
| 772.50 | –4.75MHz | –55.0 |
| 773.07 | –4.18MHz | –49.0 |
| 773.67 | –3.58MHz | –45.0 |
| 775.25 | –2.0MHz | –35.0 |
| 776.00 | –1.25MHz | –25.0 |
| 776.50 | –750kHz | –1.5 |
| 776.75 | –500kHz | –0.5 |
| 777.25 | VISUAL CARRIER | |
| 777.45 | +200kHz REFERENCE | 0.0 |
| 777.75 | +500kHz | –0.1 |
| 778.50 | +1.25MHz | –0.5 |
| 779.25 | +2.00MHz | –0.7 |
| 780.25 | +3.00MHz | –0.6 |
| 780.83 | +3.58MHz | –0.5 |
| 781.43 | +4.18MHz | –0.8 |
| 782.00 | +4.75MHz | –30.0 |
| 782.85 | +5.6MHz | –48.0 |




AMPLITUDE VS. FREQUENCY CHARACTERISTICS
Figure 2–1



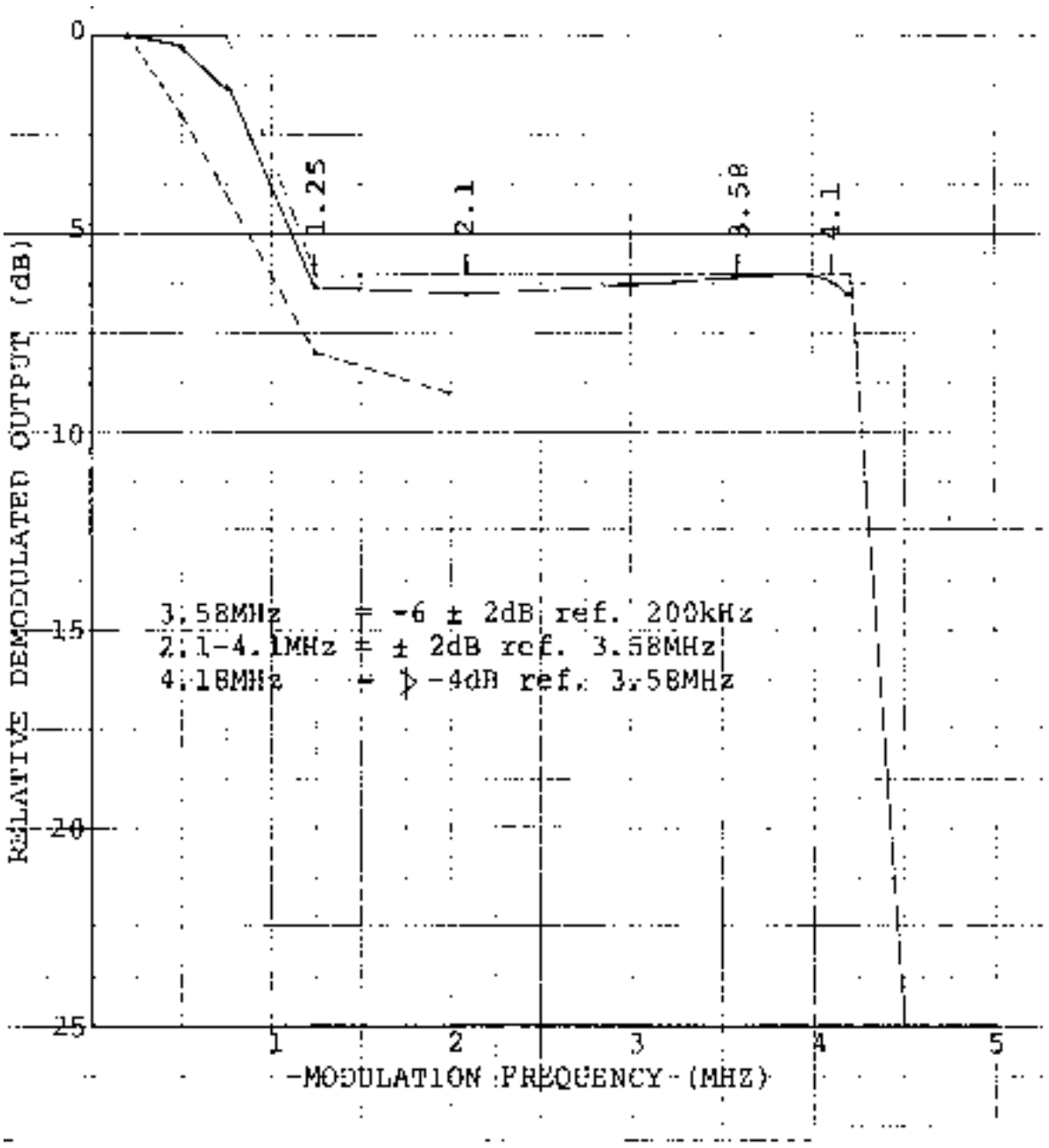

FREQUENCY RESPONSE TEST SETUP
Figure 2-1A

## 2.2 Attenuation Characteristics [73.687(a)(2)]

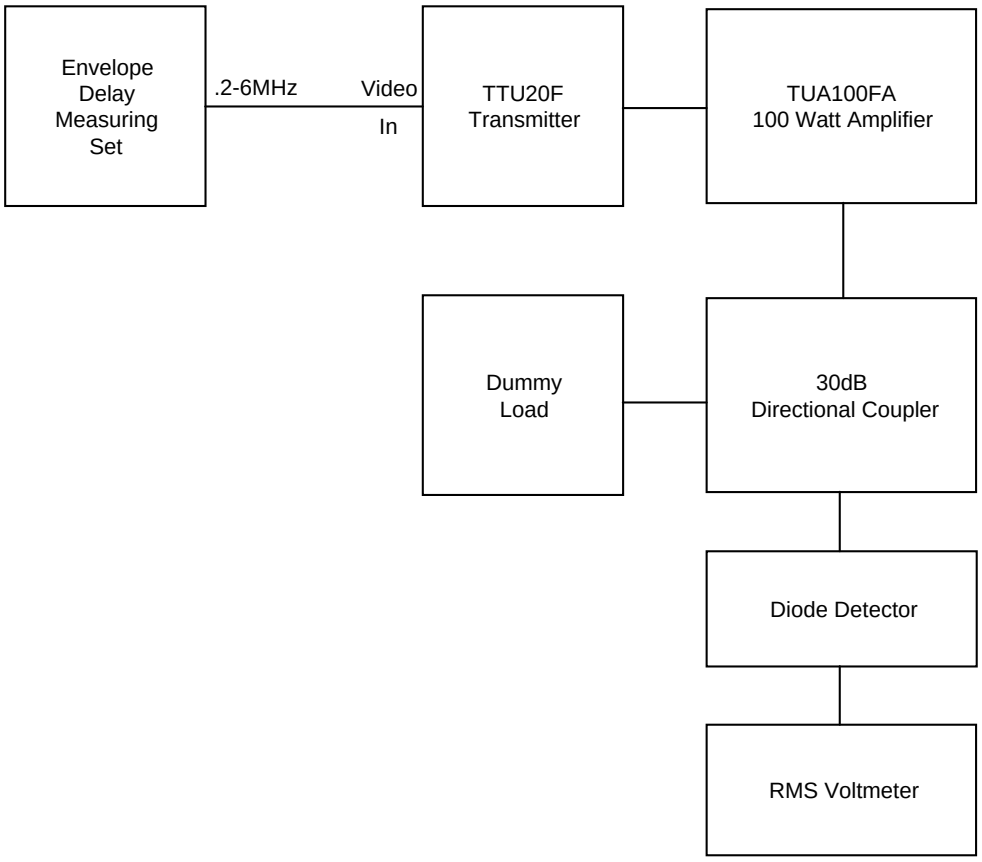
| | |
|---|---|
| Test Equipment Setup | Figure 2–2A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard sync with a variable frequency sine wave occupying the interval between pulses. Sine-wave axis was maintained at 50% of the peak sync amplitude. Sine-wave amplitude was held constant at less than 75% of the peak output voltage. |
| Aural Output Power | 0 watts |
| Method of Measurement | Sine-wave frequency was varied through the video range. The data recorded was relative to the 200kHz sideband amplitude designated as 0dB. |

ATTENUATION CHARACTERISTICS DATA

| MODULATION FREQ. (MHz) | RECTIFIED OUTPUT (dB) |
|---|---|
| 0.20 | 0.0 |
| 0.50 | –0.3 |
| 0.75 | –1.3 |
| 1.25 | –6.3 |
| 2.10 | –6.5 |
| 3.00 | –6.3 |
| 3.58 | –6.1 |
| 4.18 | –6.5 |




ATTENUATION CHARACTERISTIC CURVE
Figure 2–2




ATTENUATION CHARACTERISTICS TEST SETUP
Figure 2-2A

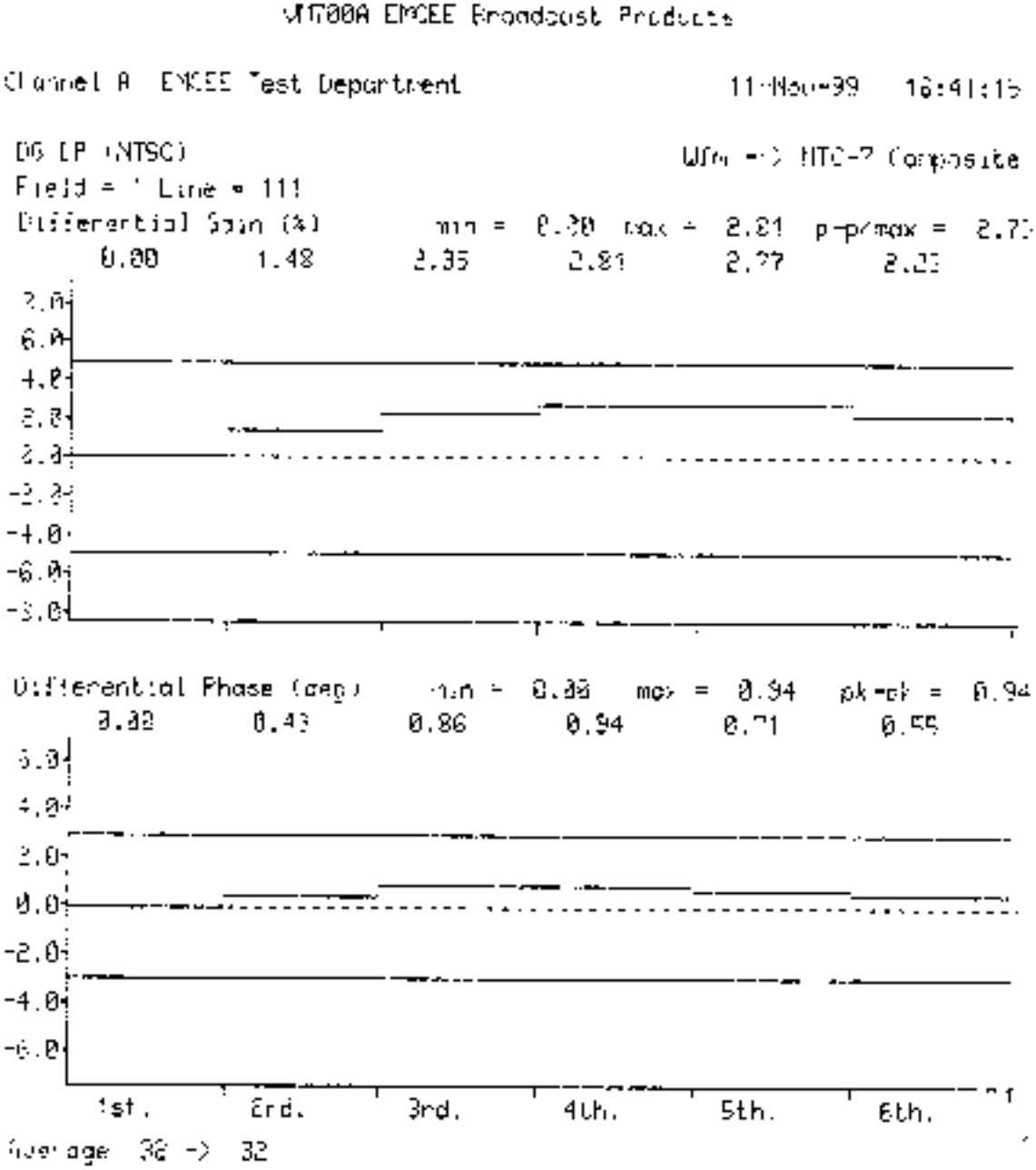
## 2.3 Differential Phase and Gain [73.682(a)(20)(vii)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–3A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard 5-riser stairstep modulated with 3.58MHz color subcarrier |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 0% |
| Method of Measurement | Data was taken from the demodulated output viewed on a waveform monitor after passing through an internal chroma filter. |

DIFFERENTIAL PHASE AND GAIN DATA

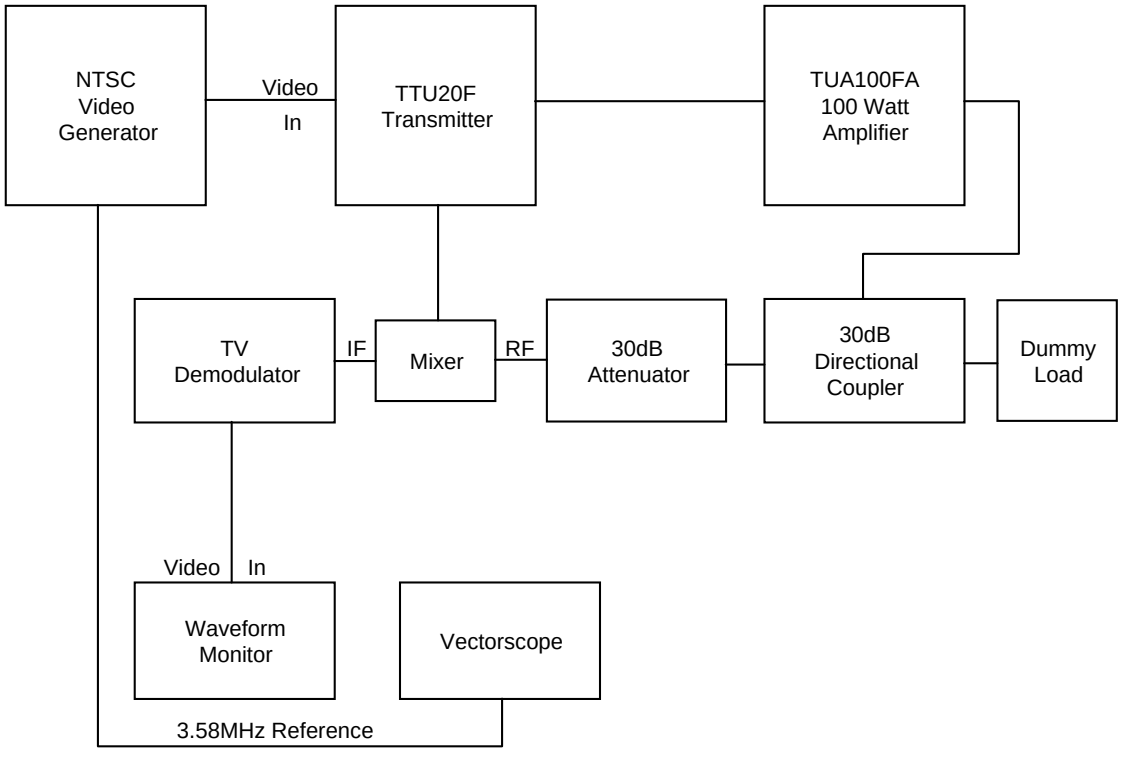
Differential Gain = 2.8%

Differential Phase = 0.94°




DIFFERENTIAL GAIN/DIFFERENTIAL PHASE

Figure 2–3



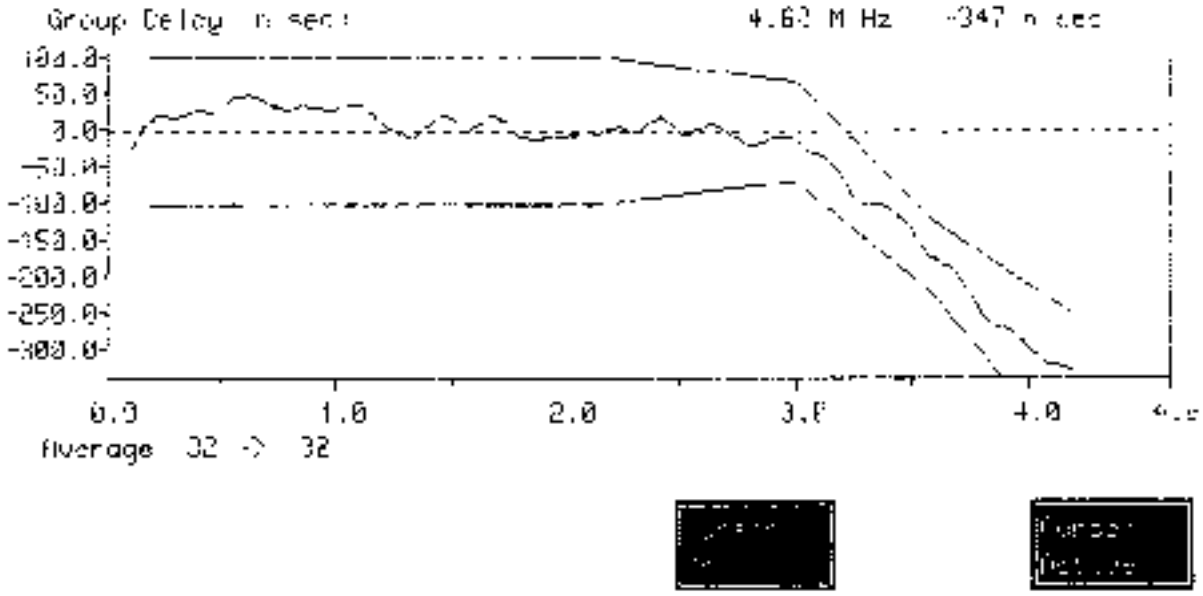

DIFFERENTIAL PHASE AND GAIN TEST SETUP
Figure 2-3A

## 2.4 Envelope Delay [73.687(a)(3)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–4A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | A variable frequency constant amplitude sine-wave with a 200kHz reference signal provided by the envelope delay test equipment |
| Aural Output Power | 0 watts |
| Method of Measurement | The sine-wave was varied through the video range and the delay data was read from the CRT display of the Envelope Delay Measuring Set. |

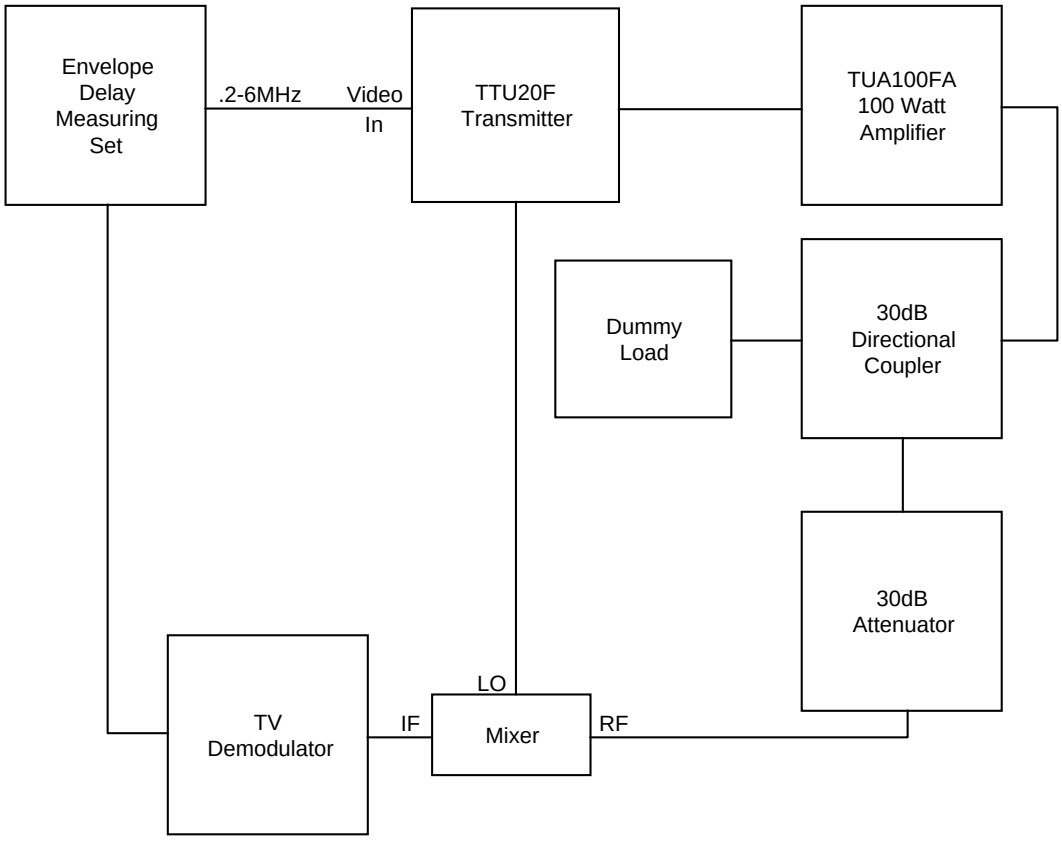
ENVELOPE DELAY VERSUS FREQUENCY DATA

| FREQUENCY | ENVELOPE DELAY (ns) |
|---|---|
| 200kHz | 0 |
| 500kHz | +25 |
| 1.0MHz | +27 |
| 1.5MHz | +12 |
| 2.1MHz | –10 |
| 2.5MHz | –6 |
| 3.0MHz | –18 |
| 3.2MHz | –66 |
| 3.4MHz | –109 |
| 3.58MHz | –176 |
| 4.0MHz | –296 |
| 4.18MHz | –330 |




ENVELOPE DELAY

Figure 2–4



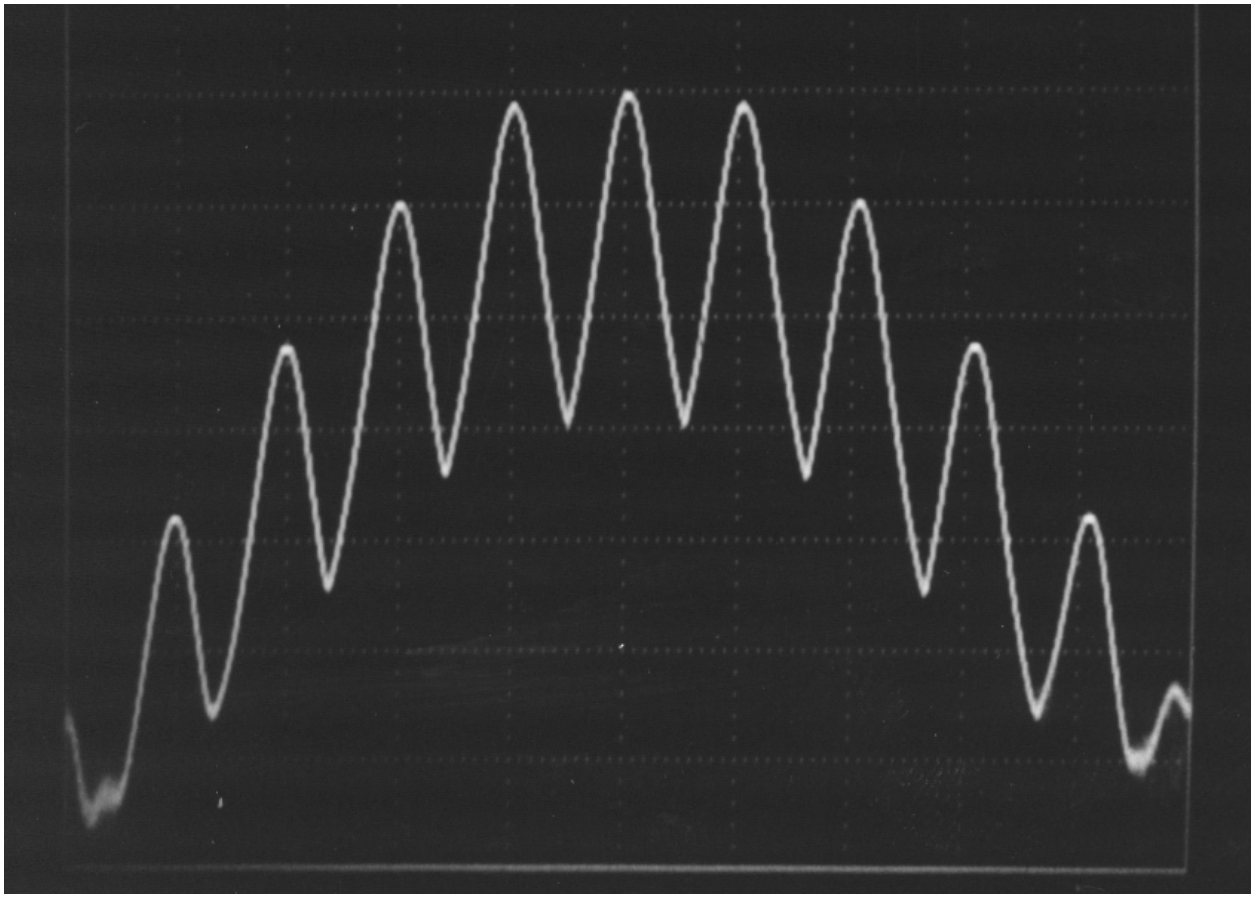

ENVELOPE DELAY TEST SETUP
Figure 2-4A

## 2.5 Aural Occupied Bandwidth [2.989(e)(5)]

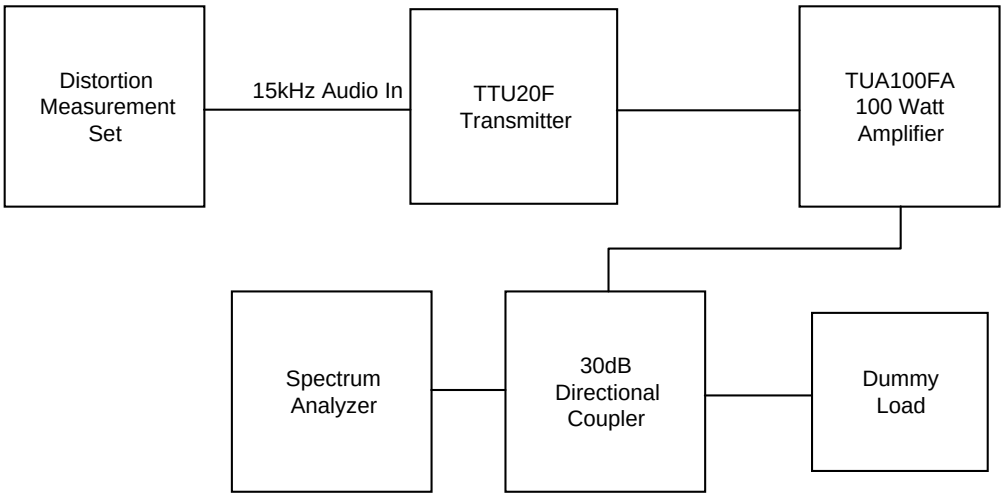
| | |
|---|---|
| Test Equipment Setup | Figure 2–5A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 0% |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 85% (21.25kHz) |
| Aural Modulation Signal | 15kHz |
| Method of Measurement | Spectrum Analyzer set at 3kHz resolution, 15kHz/division frequency span and 5ms/division sweep speed. Bandwidth was read at 0.5% (−23dB) of mean power. |

AURAL OCCUPIED BANDWIDTH DATA

Bandwidth ≈ 90kHz



AURAL OCCUPIED BANDWIDTH
Figure 2–5



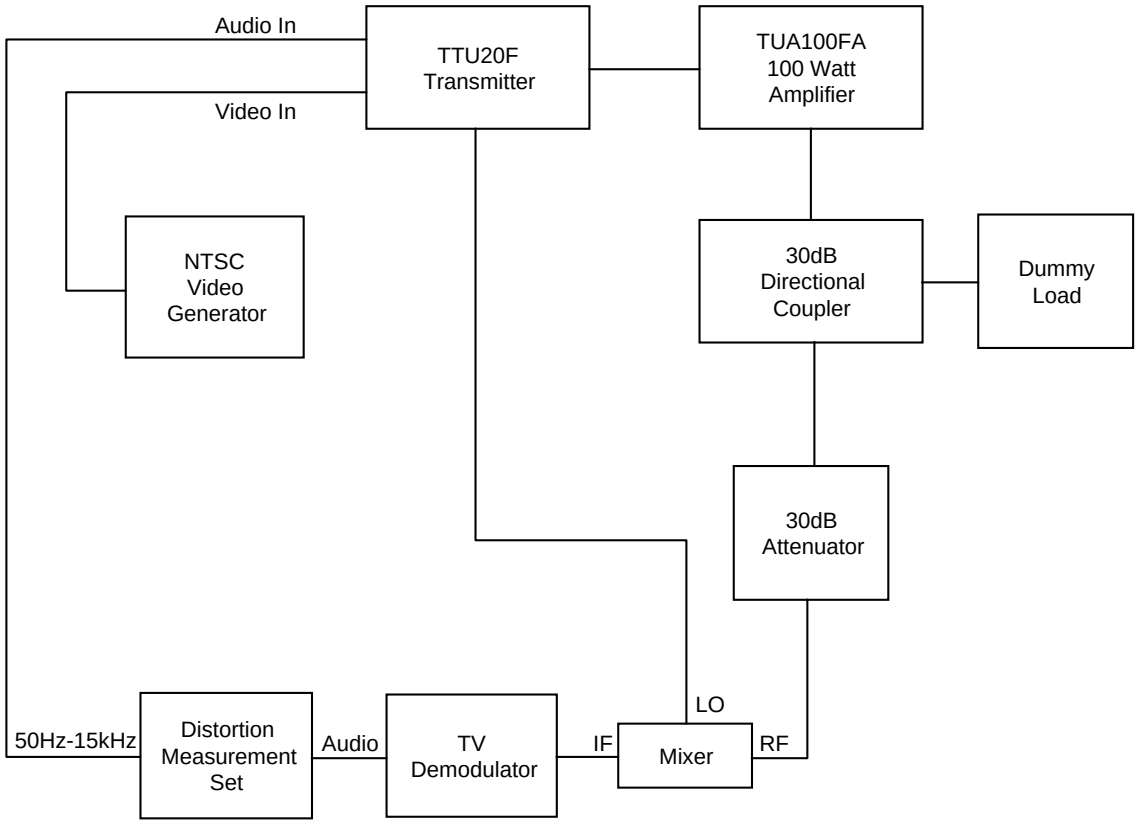

AURAL OCCUPIED BANDWIDTH TEST SETUP
Figure 2-5A

## 2.6 Aural Distortion [73.687(b)(3)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–6A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard 10 riser stairstep |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 100%, 50%, 25% |
| Aural Modulation Signal | Variable audio sine-wave from 50Hz to 15kHz |
| Method of Measurement | The aural modulation frequency was varied at three different % modulation levels and a distortion measurement was noted for each frequency-modulation combination. |

AURAL DISTORTION DATA

| FREQUENCY | % DISTORTION | | |
|---|---|---|---|
| Hz | 100% MOD | 50% MOD | 25% MOD |
| 50 | 0.39 | 0.41 | 0.44 |
| 100 | 0.34 | 0.36 | 0.40 |
| 400 | 0.31 | 0.32 | 0.37 |
| 1000 | 0.28 | 0.30 | 0.36 |
| 5000 | 0.25 | 0.29 | 0.35 |
| 7500 | 0.27 | – – – | – – – |
| 10000 | 0.30 | – – – | – – – |
| 15000 | 0.36 | – – – | – – – |



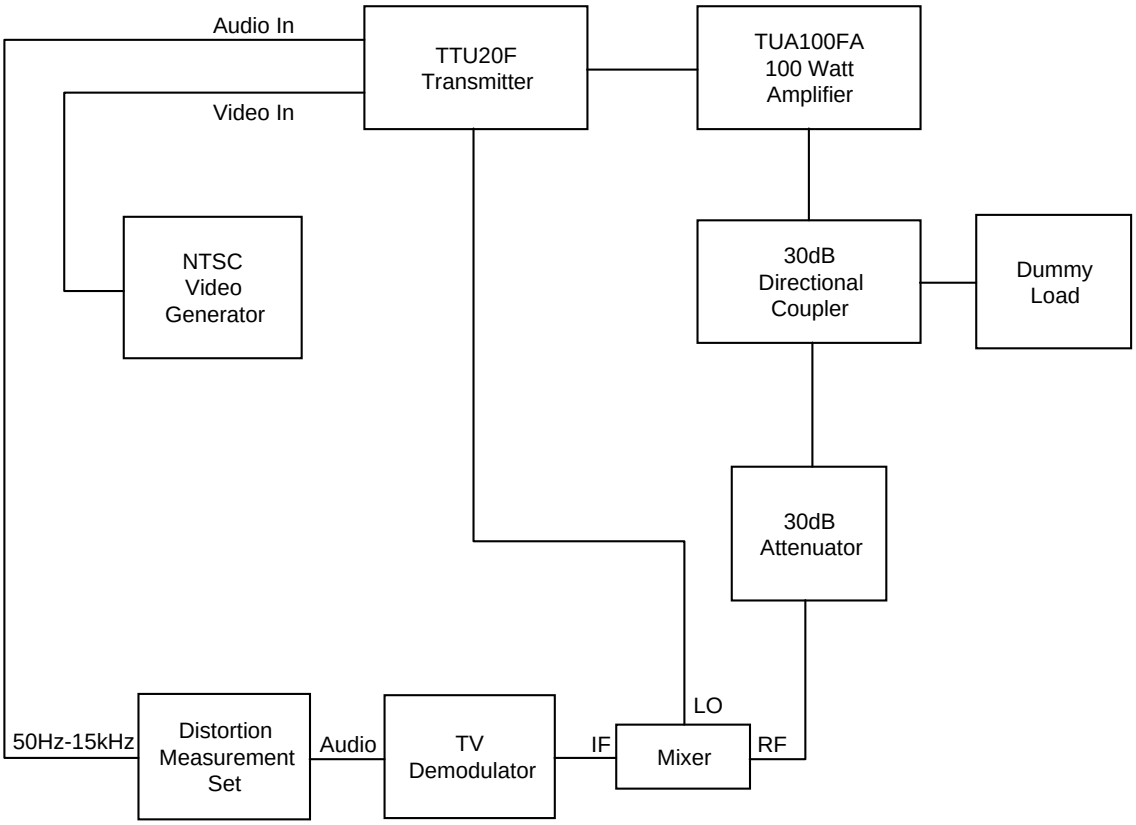

AURAL DISTORTION TEST SETUP
Figure 2-6A

## 2.7 Aural Frequency Response [73.687(b)(2)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–7A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard 10 riser stairstep |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 100%, 50%, 25% |
| Aural Modulation Signal | 50 to 15,000Hz |
| Method of Measurement | The audio input was adjusted at each audio frequency to maintain a constant modulation level. Modulation input variations were plotted directly from the dB scale of the Distortion Test Set Meter. |

AURAL FREQUENCY RESPONSE DATA

| FREQUENCY | OUTPUT LEVEL RELATIVE TO 1000Hz (dB) | | |
|---|---|---|---|
| Hz | 100% MOD | 50% MOD | 25% MOD |
| 50 | -1.6 | -1.7 | -1.8 |
| 100 | -1.2 | -1.4 | -1.4 |
| 400 | -0.8 | -1.0 | -1.1 |
| 1000 | 0 | 0 | 0 |
| 3000 | +4.0 | +3.8 | +3.7 |
| 5000 | +7.5 | +7.4 | +7.2 |
| 7500 | +10.5 | +10.3 | +10.2 |
| 10000 | +13.0 | +12.8 | +12.8 |
| 15000 | +16.1 | +15.9 | +15.7 |




AURAL PREEMPHASIS TEST SETUP
Figure 2-7A

## 2.8 Amplitude Modulation Noise [73.687(b)(5)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–8A |
| Visual Output Power | 0 watts |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 100% |
| Aural Modulation Signal | 400Hz |
| Method of Measurement | AC RMS and DC readings were taken to compute the signal to noise ratio shown below. An RC network was used with the RMS voltmeter to roll off noise above 15kHz. |

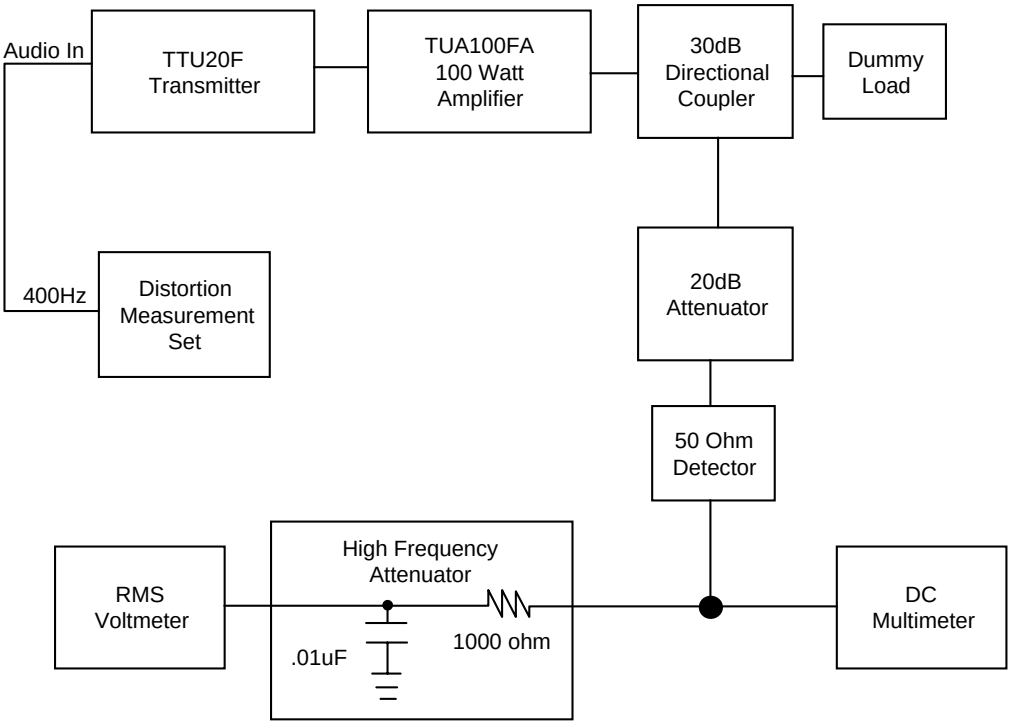
AM NOISE DATA

AC Output = 1.9mV

DC Output = 1.7V

$$\text{AM Noise} = 20 \log \frac{\text{AC Output}}{\text{DC Output}} = \frac{.0019\text{V}}{1.7\text{V}}$$

AM Noise = −59.0dB




AM NOISE TEST SETUP
Figure 2-8A

## 2.9 Frequency Modulation Noise [73.687(b)(4)]

| | |
|---|---|
| Test Equipment Setup | Figure 2–9A |
| Visual Output Power | 0 watts |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 100% and 0% |
| Aural Modulation Signal | 400Hz |
| Method of Measurement | With aural modulation applied, a reading was obtained from the Distortion Measurement Set RMS voltmeter. With modulation removed, a new reading was recorded. The signal to noise calculation was checked against the dB scale of the RMS voltmeter. |

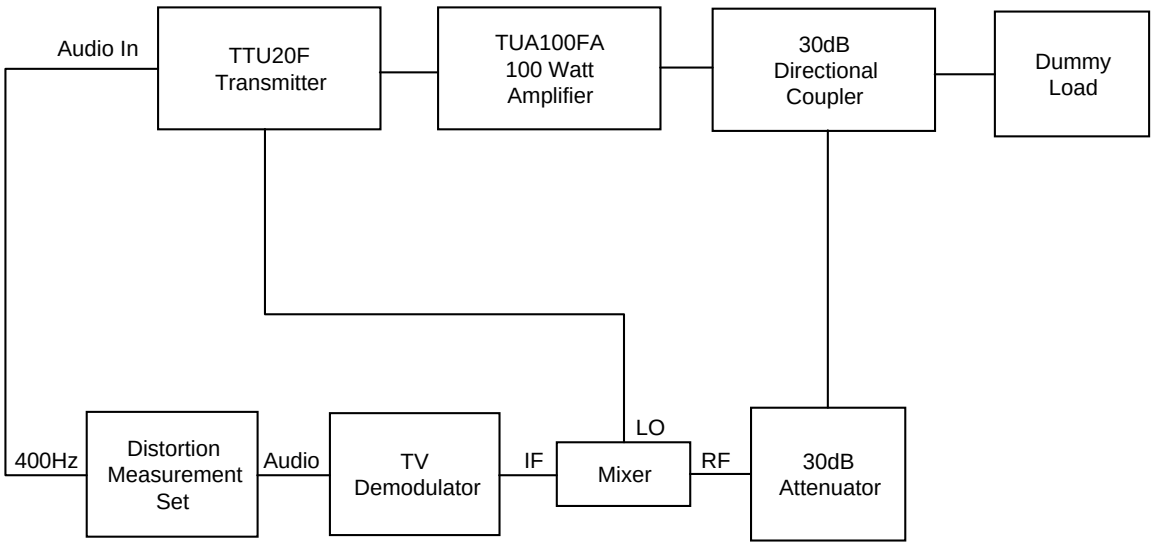
FM NOISE DATA

Detected Output w/o modulation = 2.5mV

Detected Output w/modulation = 2.9V

$$\text{FM Noise} = 20 \log \frac{\text{Output w/o modulation}}{\text{Output w/modulation}} = \frac{.0025V}{2.9V}$$

FM Noise = −61.3dB




FM NOISE TEST SETUP
Figure 2-9A

## 2.10 Antenna Terminal Radio Frequency Voltage [74.736(c)(iii)]

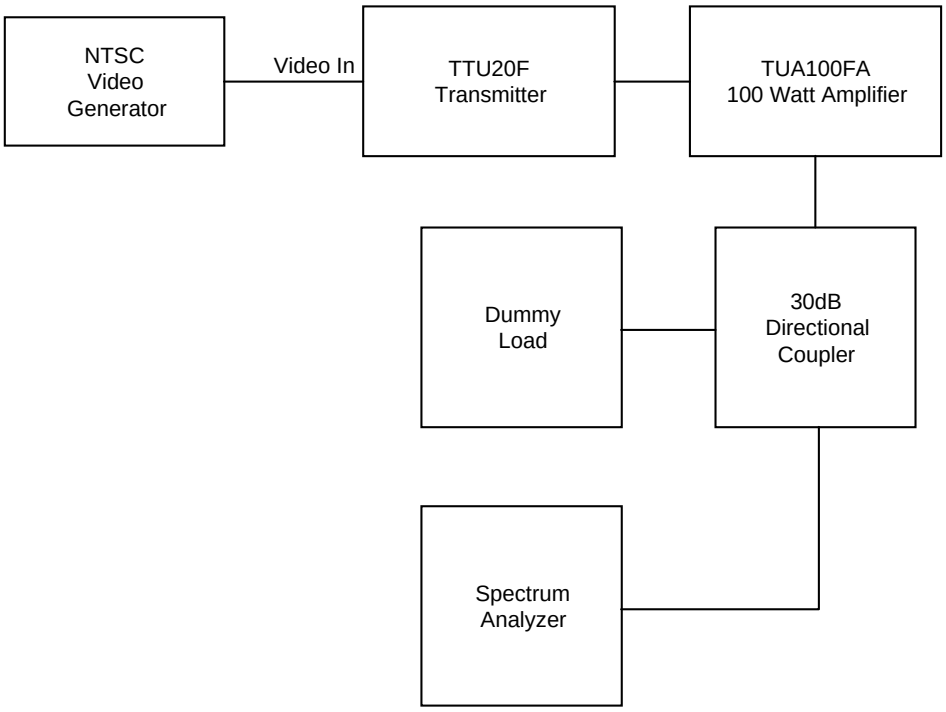
| | |
|---|---|
| Test Equipment Setup | Figure 2–10A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard 10 riser stairstep |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 0% |
| Method of Measurement | The spectrum analyzer display was adjusted for a zero reference level at the visual carrier using the following settings: |

| | | |
|---|---|---|
| Frequency Span/Division | – | 1MHz |
| Resolution Bandwidth | – | 30kHz |
| Time/Division | – | 10ms |
| Input Attenuation | – | 30dB |
| Reference Level | – | –12dB |
| Video Filter | – | Off |

All emissions were checked relative to peak sync from 0 to 10.0GHz. Those emissions below –80dB were not noted.

ANTENNA TERMINAL RF VOLTAGE DATA

| FREQUENCY (MHz) | LEVEL (dB relative to peak visual) | |
|---|---|---|
| 777.25 | 0dB | Visual Carrier |
| 781.75 | –10dB | Aural Carrier |
| 772.75 | –56dB | Visual Carrier –4.5MHz |
| 786.25 | –60dB | Aural Carrier +4.5MHz |
| 768.25 | –60dB | Visual Carrier –9.0MHz |
| 790.75 | –62dB | Aural Carrier +9.0MHz |
| 823.00 | –61dB | Visual Carrier +45.75MHz |
| 1554.50 | –62dB | Visual 2nd Harmonic |
| 1563.50 | –67dB | Aural 2nd Harmonic |




ANTENNA TERMINAL RF VOLTAGE TEST SETUP
Figure 2-10A

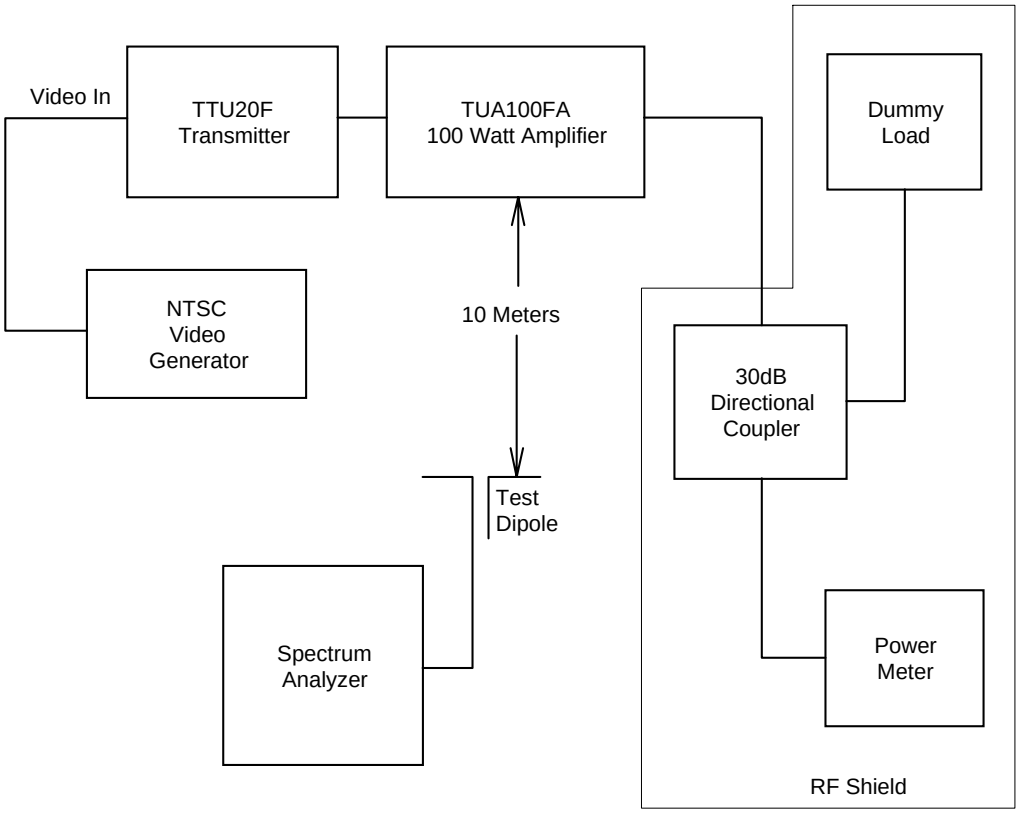
## 2.11 Spurious Radiation Field Strength [2.993]

| | |
|---|---|
| Test Equipment Setup | Figure 2–11A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard 10 riser stairstep |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 0% |
| Method of Measurement | The broadband receive antennas were moved horizontally and vertically around the unit to maximize receive level. Absolute power level of each spurious radiation was measured on a calibrated spectrum analyzer and converted to an equivalent field strength by finding the power density (absolute power divided by the antenna area). The relative field strength of the spurious radiation was then calculated with respect to the unit's rated output power. The field strength of the rated output was found using $\sqrt{49.2P}/R$ (P = rated output, R = distance). All emissions were assumed to be radiated from half-wave dipoles. Frequencies scanned extended from 20MHz to 10.0GHz. |

SPURIOUS RADIATION FIELD STRENGTH DATA

E Output = $\sqrt{49.2P}/R = \sqrt{(49.2)(100)}/10 = 7.01$Volts/Meter

| FREQUENCY (MHz) | | POWER MEASURED (dBm) | EQUIVALENT FIELD STRENGTH (VOLTS/METER) | RELATIVE FIELD STRENGTH (dB) |
|---|---|---|---|---|
| Visual | 777.25 | -53 | $9.85 \times 10^{-3}$ | -57.0dB |
| Aural | 781.75 | -62 | $3.52 \times 10^{-3}$ | -66.0dB |
| LO | 823.00 | Not Visible | – – – – – – | – – – – |
| 2nd Harmonic | 1554.50 | Not Visible | – – – – – – | – – – – |




SPURIOUS CABINET RADIATION TEST SETUP
Figure 2-11A

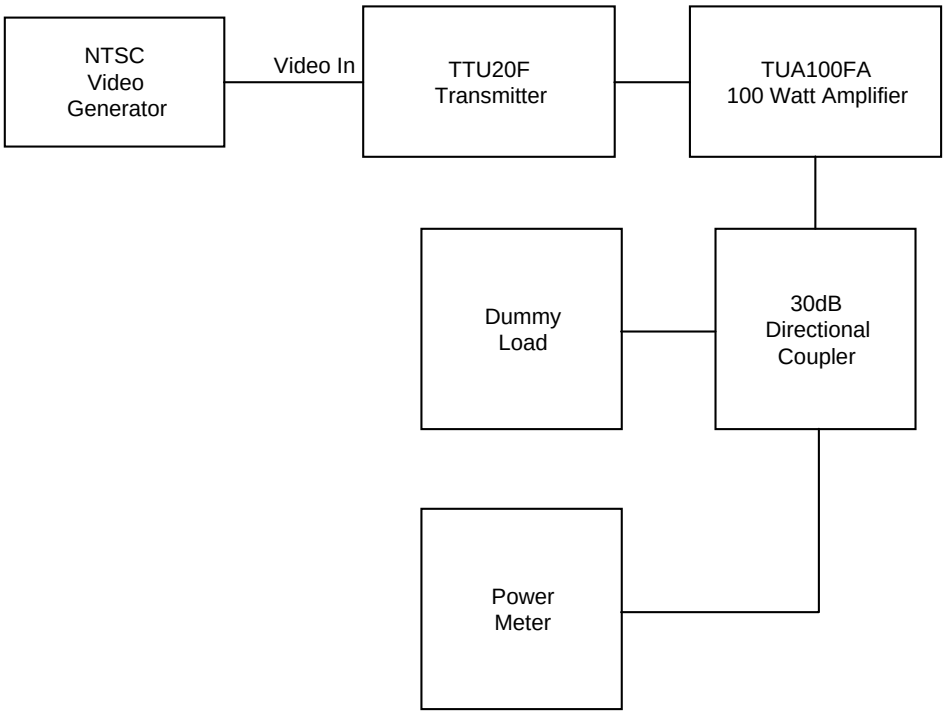
## 2.12 Power Output Meter Calibration [2.985]

| | |
|---|---|
| Test Equipment Setup | Figure 2–12A |
| Visual Output Power | 100 watts peak |
| % Video Modulation | 87.5% |
| Type Video Modulation | Standard sync with blanking level set at 75% of peak sync and maintained through the interval between pulses. |
| Aural Output Power | 10 watts average |
| % Aural Modulation | 0% |
| Method of Measurement | The TTU20F Driver was adjusted to obtain a 59.5mW average visual reading from the TUA100FA Amplifier. This power level corresponds to 100 watts peak power when using the factor of 1.68 and compensating for the output attenuation as shown: |

| [59.5mW] | x | [$10^3$] | x | [1.68] = 100W |
|---|---|---|---|---|
| meter reading | | attenuation | | power factor |

The modulator's aural level was then adjusted to obtain a 69.5mW indication on the external power meter (59.5W average visual + 10W average aural –30dB = 69.5mW).

The VIS MTR (R9) control of the Metering Detector circuit, located on the right side wall of the TUA100FA Amplifier drawer, was adjusted to provide a 100% indication on the % POWER meter with the meter switch set to the FWD position.




POWER OUTPUT METER CALIBRATION TEST SETUP
Figure 2-12A

## 2.14 Certification Identification Label [2.1003]

The certification identification label for the aforementioned model is shown below. This label shall be displayed conspicuously on the front panel of the appropriate unit.

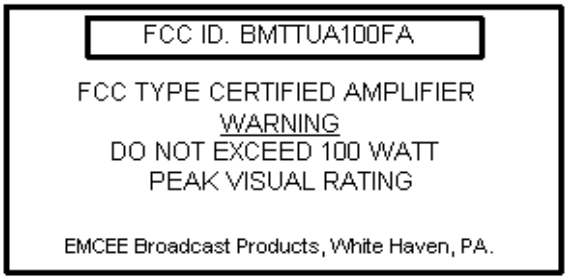
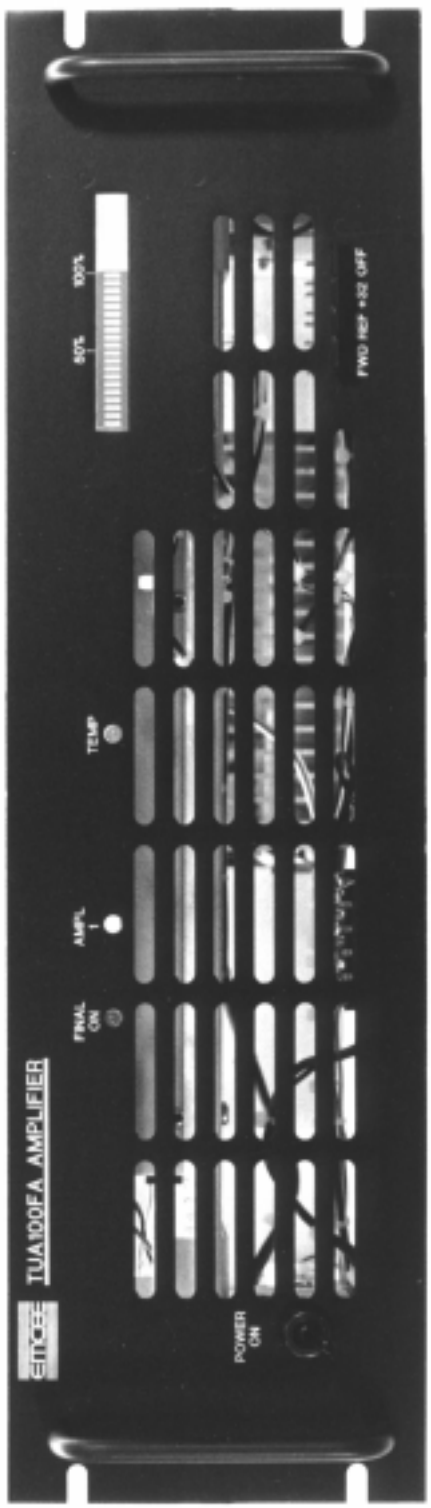


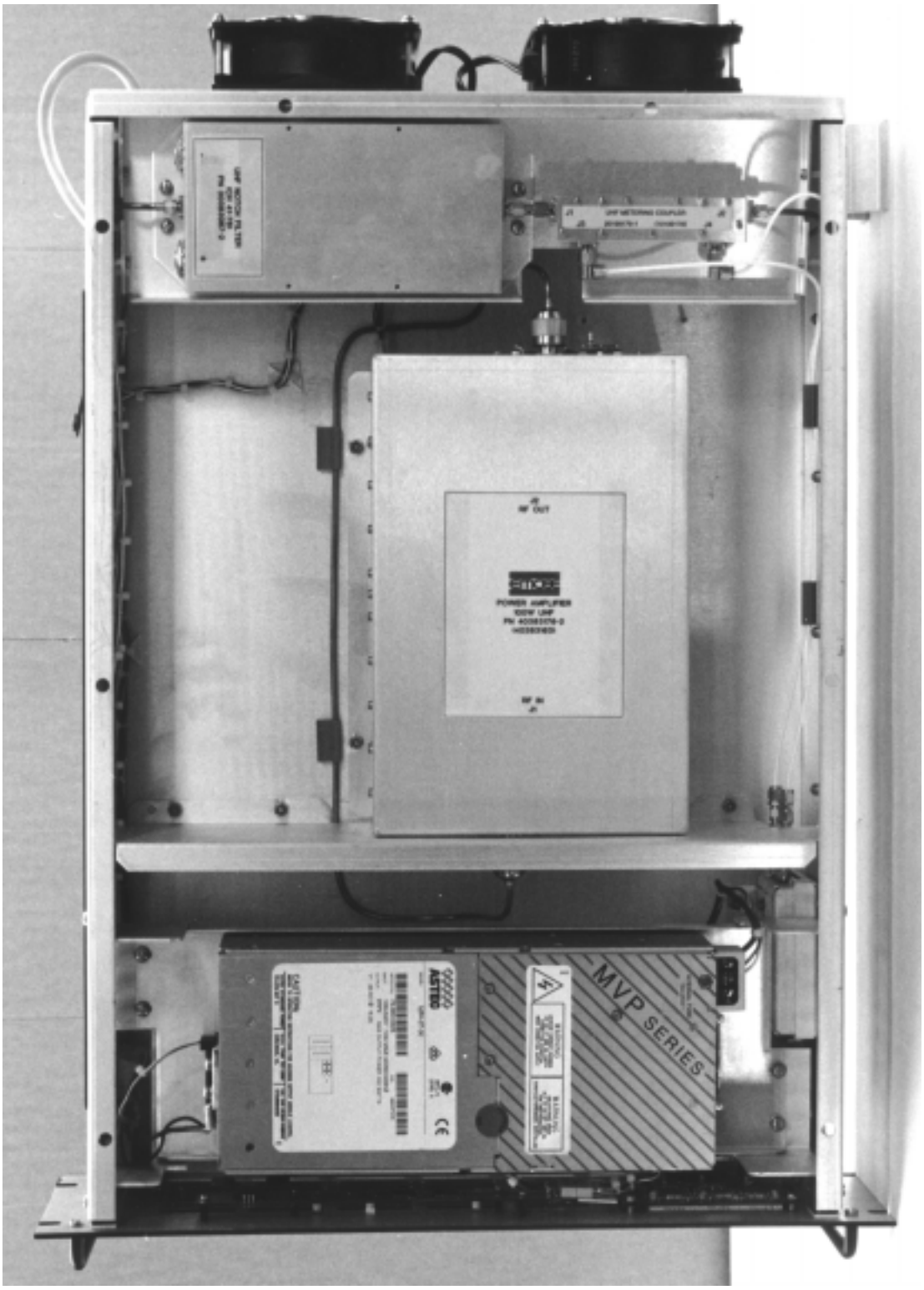

Figure 2–14

## 2.15 Photographs [2.983 (g)]

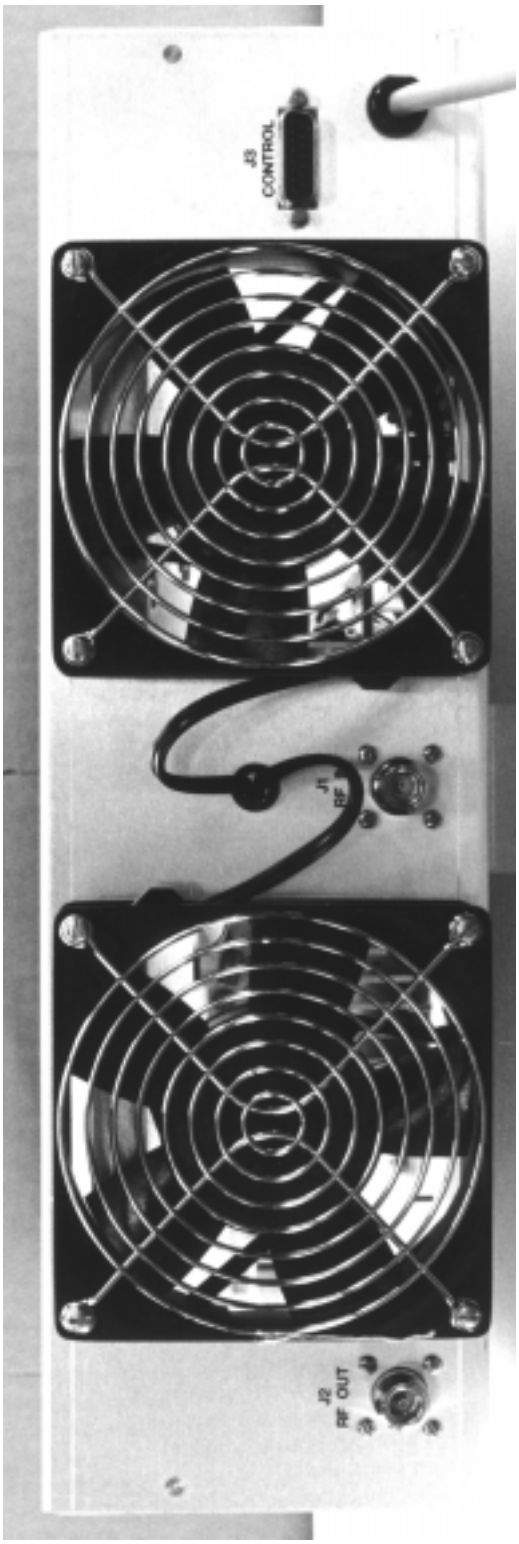
The following photographs will be used as part of the TUA100FA Instruction Manual.




TUA100FA Amplifier Front View

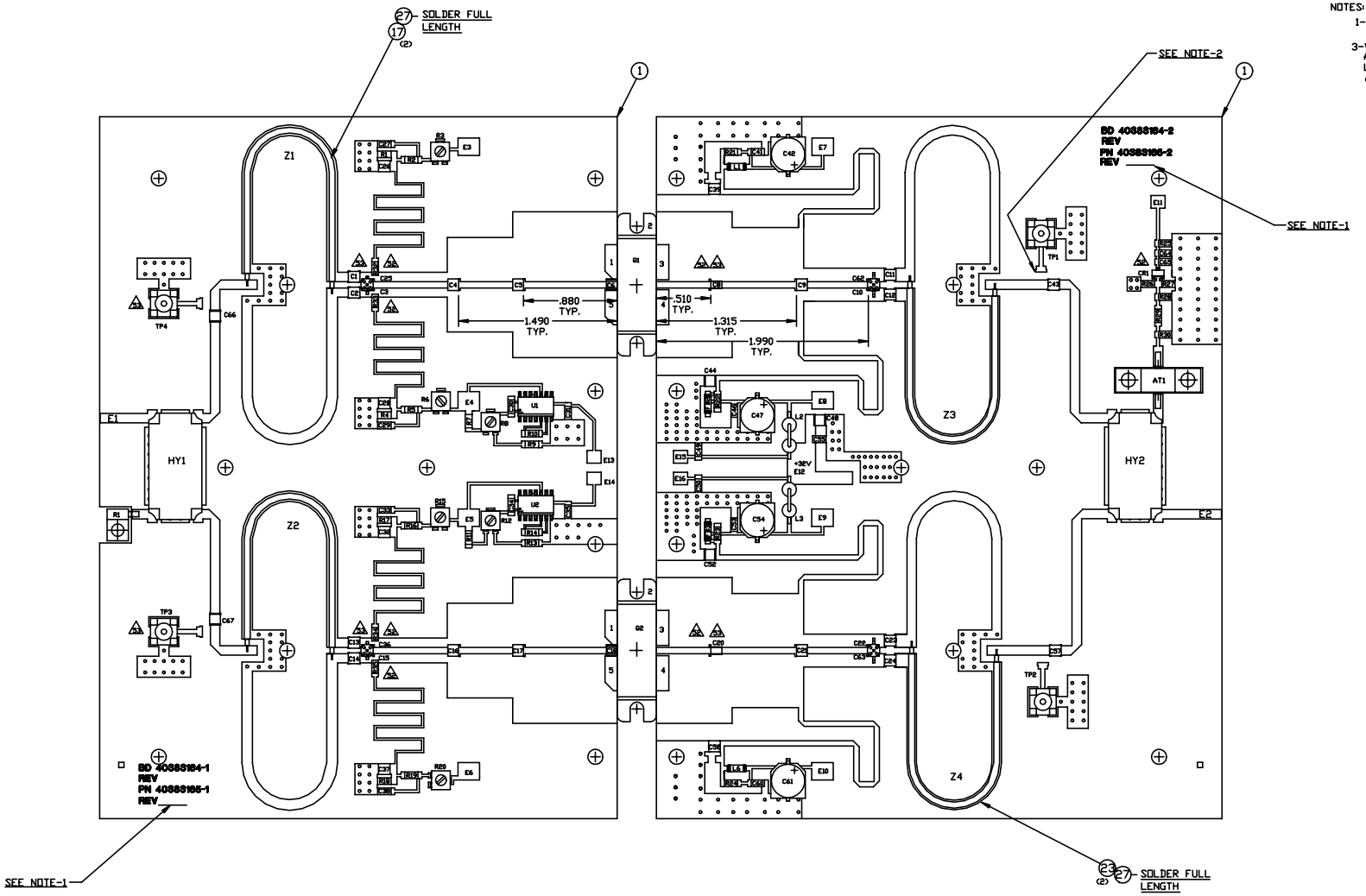



TUA100FA Amplifier Internal View




TUA100FA  Amplifier Rear View

NOTES: UNLESS OTHERWISE SPECIFIED.
1-MARK REV LEVEL PER SHT 1 OF 1 AND A232-107-3.
3-WHEN TESTING, REMOVE C43, C57, C66, AND C67, PLACE THEM ACROSS GAP LEADING TO TEST POINT. (TP1, TP2, TP3, TP4)




REV: 53 (-1) PCB ASSY., 100W AMPL, (INPUT)

REV: 53 (-2) PCB ASSY., 100W AMPL, (OUTPUT)

| ECN | DATE | BY | | CHK | CHK | APPV'L |
|---|---|---|---|---|---|---|
| EM 234 | 10/14/99 | A.C. | MADE CHANGES PER ENG. MEMO | | | |
| EM 227 | 4/13/99 | A.C. | ITEM 12 WAS PN NACE100M508X10 MADE CHANGES PER ENG. MEMO 227 | A.C. | | |

| | | | |
|---|---|---|---|
| NEXT ASSY: | DRAFT | 12/14/98 | A.C. |
| | DR. CHK | | |
| VERSION | M. ENGR | | |
| MODEL | E. ENGR | | |
| SCALE | RELEASE | | |

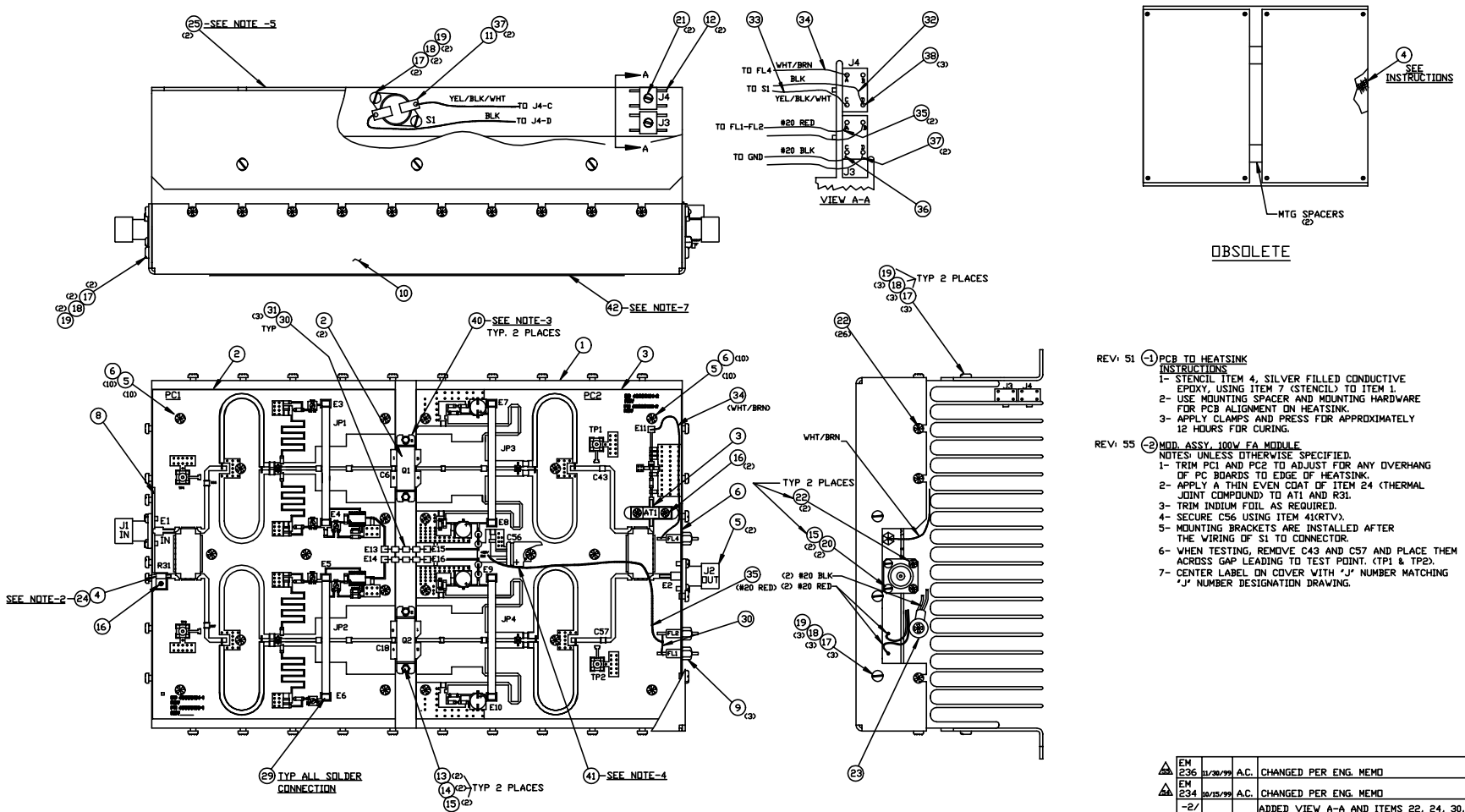
TOLERANCES - EXCEPT AS NOTED
DECIMAL XX ± .010, XXX ± .005
FRACTIONAL ± 1/64"
ANGULAR ± 1/2 DEG

EMCEE BROADCAST PRODUCTS INC.
WHITE HAVEN, PA. 18661

PCB ASSEMBLY, 100 WATT AMPLIFIER 470-800MHz

40383165 REV SEE DASH No.

SHEET 1 OF 1




OBSOLETE

REV: 51 (-1) PCB TO HEATSINK

INSTRUCTIONS

1- STENCIL ITEM 4, SILVER FILLED CONDUCTIVE EPOXY, USING ITEM 7 (STENCIL) TO ITEM 1.
2- USE MOUNTING SPACER AND MOUNTING HARDWARE FOR PCB ALIGNMENT ON HEATSINK.
3- APPLY CLAMPS AND PRESS FOR APPROXIMATELY 12 HOURS FOR CURING.

REV: 55 (-2) MOD. ASSY. 100W FA MODULE

NOTES: UNLESS OTHERWISE SPECIFIED.

1- TRIM PC1 AND PC2 TO ADJUST FOR ANY OVERHANG OF PC BOARDS TO EDGE OF HEATSINK.
2- APPLY A THIN EVEN COAT OF ITEM 24 (THERMAL JOINT COMPOUND) TO AT1 AND R31.
3- TRIM INDIUM FOIL AS REQUIRED.
4- SECURE C56 USING ITEM 41(RTV).
5- MOUNTING BRACKETS ARE INSTALLED AFTER THE WIRING OF S1 TO CONNECTOR.
6- WHEN TESTING, REMOVE C43 AND C57 AND PLACE THEM ACROSS GAP LEADING TO TEST POINT. (TP1 & TP2).
7- CENTER LABEL ON COVER WITH "J" NUMBER MATCHING "J" NUMBER DESIGNATION DRAWING.

| ECN | DATE | BY | | CHK | CHK | APPV'L |
|---|---|---|---|---|---|---|
| EM 236 | 11/30/99 | A.C. | CHANGED PER ENG. MEMO | | | |
| EM 234 | 10/15/99 | A.C. | CHANGED PER ENG. MEMO | | | |
| -2/ 53 | 8/31/99 | A.C. | ADDED VIEW A-A AND ITEMS 22, 24, 30, 32-38, AND 40. ADDED R31, C43, C57, FL1-FL4. | | | |
| 52 | 5/29/99 | A.C. | ADDED NOTE-6 AND ITEMS 27, 28, & 29 | C.T.T. | | |

| | | | |
|---|---|---|---|
| NEXT ASSY: | | DRAFT 4/15/99 | L.H. |
| | | DR. CHK 5-3-99 | C.T.T. |
| VERSION | | M. ENGR | |
| MODEL TUA100FA | | E. ENGR | |
| SCALE 1/1 | | RELEASE | |

TOLERANCES - EXCEPT AS NOTED
DECIMAL ± .010 / .XXX ± .005
FRACTIONAL ± 1/64"
ANGULAR ± 1/2 DEG

EMCEE BROADCAST PRODUCTS INC. WHITE HAVEN, PA 18661

ASSEMBLY, MODULE, 100W AMPLIFIER

40383176 | REV SEE DASH No.

SHEET 1 OF 1