Section 4
Maintenance

page contents

4-2 Routine Maintenance

4-3 Getting Inside the Chassis

4-3 Front panel — open and close
4-4 Rear panel — remove and replace
4-5 Input Filter Board — remove, replace
4-6 D-Connector Board — remove, replace
4-6 Power Supply — remove, replace

4-7 In-System Testing ("Proof of Performance")

4-8 Monophonic Performance Verification

4-9 Field Audit of Performance

4-13 Field Alignment

4-14 Prepare the Unit
4-14 Test Power Supplies (Optional)
4-16 Calibrate and Test Card #1 (Analog Input/Output Circuitry)
4-17 Return OPTIMOD-TV to Service



CAUTION

The installation and servicing instructions in this manual are for use by qualified personnel only. To avoid electric shock do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Routine Maintenance

The 8282 OPTIMOD-TV Audio Processor uses highly stable analog and digital circuitry throughout. Recommended routine maintenance is minimal.

1. Periodically check audio level and gain reduction meter readings.

Become familiar with normal audio level meter readings, and with the normal performance of the G/R metering. If any meter reading is abnormal, see Section 5 for troubleshooting information.

2. Listen to the 8282's output.

A good ear will pick up many faults. Familiarize yourself with the "sound" of the 8282 as you have set it up, and be sensitive to changes or deteriorations. But if problems arise, please don't jump to the conclusion that the 8282 is at fault. The troubleshooting information in Section 5 will help you determine if the problem is with OPTIMOD-TV or is somewhere else in the station's equipment.

3. Periodically check for corrosion.

Particularly in humid or salt-spray environments, check for corrosion at the input and output connectors and at those places where the 8282 chassis contacts the rack.

4. Periodically check for loss of grounding.

Check for loss of grounding due to corrosion or loosening of rack mounting screws.

5. Clean the front panel when it gets soiled.

Wash the front panel with a mild household detergent and a damp cloth. Stronger solvents should not be used because they may damage plastic parts, paint, or the silk-screened lettering (99% isopropyl alcohol can be safely used).

Getting Inside the Chassis

- Access the **AC POWER** switch by opening the 8282's front panel (see below). The **AC POWER** switch is located on the power supply module to the right of the chassis.
- The **VOLTAGE SELECTOR** switch and the two fuses are on the 8282's rear panel.
- Access the **circuit cards** by opening the 8282's front panel.
- Most set-up and adjustment of the 8282 can be done from the front panel without accessing the interior of the chassis. Alignment of the 8282 requires access only to the front and rear panels and to those interior parts of the unit behind the front panel. Almost all servicing can be done without removing either the top or bottom covers.

Further disassembly of the 8282 may be required for some service procedures.

For access to:	See page:
Behind front panel	4-3
Behind rear panel	4-4
Input Filter Board	4-5
D-Connector Board	4-6
Power Supply	4-6

For best RFI protection, replace *all* screws and tighten them firmly. If screws are lost, replace them with screws of the same length (longer screws may cause mechanical interference or internal short circuits). Most screws used in the 8282 are equipped with integral lockwashers for secure fastening. If a pan head screw is substituted, use an internal-star lockwasher. All screws are steel, plated with zinc.

Front panel — open and close

To open:

1) Disconnect power to the unit.

   WARNING: Hazardous voltage is exposed with the front panel open and the power ON.



2) Remove the six Philips head screws at the top and bottom of the front panel with a Philips screwdriver.

3) Grasp the edges of the panel, pull slightly forward, and, while holding the panel vertical, guide it forward and downward on its supports. Then rotate the top of the panel toward you and down until it rests on its supports.

To close:

1) Check that the internal AC POWER switch is set to ON (depressed).

2) Rotate the panel until it is vertical. Raise the panel while guiding it in on its supports.

3) Fasten the six screws that secure it in place with a Philips screwdriver.

Rear panel — remove and replace

To remove:

1) Disconnect the 8282 and remove it from the rack.

   It is not practical to remove the rear panel when the 8282 is mounted in a rack.

2) Set the unit upright on a padded surface with the rear panel facing you.

3) Remove the four screws holding the power supply.

4) Remove the sixteen screws that hold the rear panel to the chassis.

   Leave about six inches (15cm) between the rear panel and the edge of your work surface.

5) *Very carefully* pull the rear panel about ¾-inch (2cm) toward you until the internal connectors become unplugged.

   The internal connectors are delicate and easily damaged. Be sure to pull the panel directly and straight away from the chassis.

   Take care to not damage the connector pins on the Motherboard while they are exposed.

To replace:

1) Tilt the rear panel up until it is nearly vertical and plug the two or three cables (depending on your unit's Model #) into the Motherboard.

2) *Very carefully* line up the three connectors on the input Filter Board with their mating connectors on the Motherboard. Be sure that all three connectors are properly engaged and push the rear panel in to seat the connectors.

   The connectors are delicate and easily damaged. Do not force them.

   If you encounter difficulty, you may remove the top cover to gain visual access to the connectors. When replacing the top, be sure that the circuit cards and the card guides are aligned.

3) Replace all twenty screws previously removed.

   Do not tighten any screws until they are all loosely in place.

4) Return the 8282 to its rack, connect and ground unit.

Input Filter Board — remove, replace

To remove Input Filter Board:

1) Remove the rear panel.
See page 4-4.

2) Remove the 4-40 machine screw between the left input and output XLR connectors.

3) Using a small screwdriver, unlock each XLR connector insert.
The lock is accessible through a small hole in the face of the connector.
Turn the lock ¼ turn counter-clockwise to release.

4) Remove the Input Filter Board by gently pulling the board away from the panel.

To replace Input Filter Board:

1) Place the board in position over the panel and insert the XLR connectors into the panel.

2) Lock the XLR connectors.
Turn the lock ¼ turn clockwise.

3) Replace the screw between the left input and output XLR connectors.

4) Replace the rear panel.
See page 4-4.

D-Connector Board — remove, replace

To remove:

1) Remove the rear panel.
See page 4-4.

2) Remove the six hex nut jackscrews holding the D-connectors to the rear panel.

3) Remove the one 4-40 screw holding the D-Connector Board to the rear panel.

To replace:

1) Position the board with the D-connectors through the rear panel. Replace the one 4-40 screw and the six jackscrews.
Do not tighten any screws until all screws are loosely in place.

2) Replace the rear panel.
See page 4-4.

Power Supply — remove, replace

To remove:

1) Disconnect the line cord.

2) Remove the four screws holding the power suppiy to the rear panel.

3) Open the front panel.
See page 4-3.

4) Grasp the power supply module (located at the far right of the chassis) by its handle and pull it forward until it un-mates from its connector. Then slide the module out of the chassis to free it.

To replace:

1) Align the power supply module with its guide rails and push it back until it mates firmly with its connector on the Motherboard.

2) Replace and tighten the four screws that mount the power supply to the rear panel.

3) Close the 8282's front panel.
See page 4-3.
Be sure that the internal AC POWER switch is set to ON (depressed).

4) Re-connect the line cord.

In-System Testing ("Proof of Performance")

Most stations will want to make periodic equipment performance measurements to ensure that their transmission system is working correctly and that they comply with all government regulations. The text below provides the general information that is needed to perform measurements verifying the performance of a transmission system including the 8282. Instructions for bench-top verification of 8282 performance *outside of the transmission system* are found below in **Field Audit of Performance** starting on page 4-9.

These instructions are written with the assumption that the analog inputs and outputs are used. If the optional digital I/O is used instead, follow the procedures below by analogy — you will have to supply digitized test tones.

The **NAB Broadcast and Audio System Test CD** provides a good source of digitally-generated test tones on compact disc. Note, however, that these tones are at a 44.1kHz sampling rate. They can only be directly applied to the 8282's optional AES/EBU digital input if it is fitted with the 8200D/SRC Digital I/O card, which performs sample-rate conversion. The 8200D/32 Digital I/O card only accepts audio digitized at a 32kHz sample rate and will not work. This test CD is available from:

NAB Services
1771 N Street N.W.
Washington, D.C. 20036, U.S.A.
order: (1) (800) 368-5644

Required Equipment:

- Ultra-low distortion sine-wave oscillator/THD analyzer/audio voltmeter

  (With verified residual distortion below 0.01%. Sound Technology 1710B; Audio Precision System One, or similar high-performance system.)

  (The **NAB Broadcast and Audio System Test CD** is an excellent source of test signals when used with a high-quality CD player.)

- Precision TV aural modulation monitor or demodulator

  (Belar; TFT, Tektronix, or similar.)

- **optionally**, baseband spectrum analyzer, 0-100kHz

  (Tektronix 5L4N plug-in with 5111 bistable storage mainframe or similar.)

Monophonic Performance Verification

Monophonic performance verification (using the left channel for convenience; the right channel could also be used) is straightforward. Recall the test preset BY BYPASS, and drive the left OPTIMOD-TV input with the test signal. Sufficient headroom is available to modulate to more than 130% at all frequencies from 50 to 15,000Hz.

1. Prepare the unit.

A☐ From the IDLE screen, press RECALL PRESET button to access the RECALL PRESET screen.

B☐ Scroll to BY BYPASS.

C☐ Press RECALL& MODIFY button to put BY BYPASS on the air and access its screen controls.

This test tone defeats all compression, limiting, and clipping, but leaves the 15kHz low-pass filter in the signal path.

D☐ Set the controls as follows:

BYPASS GAIN dB	+6
30Hz HPF	OFF

This scales the gain through the 8282 so that a 50Hz tone applied to the analog input at 6dB below the A-I CLIP LVL dBu that you preset (in the I/O CALIB screen) produces the following output levels:

a) at the left and right analog outputs: the level in dBu that you preset as the A-O 100% LVL dBu (in the I/O CALIB CONTROL or QUICK SETUP screen); and

b) at the optional AES/EBU digital output: 2.76dB below the maximum digital word on both left and right channels (8282D/32 Card) or the level that you preset as the D-O 100% LVL dB (in the I/O CALIB CONTROL screen), if you're using the 8200D/SRC Digital I/I Card.

Please note that OPTIMOD-TV's frequency response drops off extremely rapidly above 15kHz. If the test oscillator is mis-calibrated, OPTIMOD-TV may appear not to meet its frequency response specification at 15kHz. Before blaming OPTIMOD-TV, measure the output frequency of the test oscillator with an accurate counter to make sure that it is actually producing 15kHz, and not some slightly higher frequency.

E☐ Press ESC to return to the IDLE screen.

Field Audit of Performance

Required Equipment:

- Ultra-low distortion sine-wave oscillator/THD analyzer/audio voltmeter

  (With verified residual distortion below 0.01%. Sound Technology 1710B; Audio Precision System One, or similar high-performance system.)

  (The **NAB Broadcast and Audio System Test CD** is an excellent source of test signals when used with a high-quality CD player.)

- Spectrum analyzer with tracking generator

  (Tektronix 5L4N plug-in with 5111 bistable storage mainframe, or similar. Alternatively, a sweep generator with 50 – 15,000Hz logarithmic sweep can be used with an oscilloscope in X/Y mode, or you can use a computer-controlled test set like the Audio Precision One.)

- Two 620Ω ±5% resistors.

This procedure is useful for detecting and diagnosing problems with the 8282's performance. It includes checks of frequency response, noise and distortion performance, and output level capability. It requires the Analog I/O Card.

The 8282 performs a self-test of important digital circuitry upon power-up. Many problems that could occur in the digital circuitry can be automatically diagnosed by this self-test. If the 8282 fails the self-test, this will be indicated on the front panel, along with a fault diagnosis (if possible).

The self test does not test the Analog I/O Card, part of the optional AES/EBU digital I/O circuitry, and some of the microprocessor-based control circuitry. (The microprocessor supervises the self-test, and will obviously be unable to complete it if the microprocessor or its vital supporting circuitry is faulty.)

This performance audit assesses the performance of the analog-to-digital and digital-to-analog converters and verifies that the digital signal processing section (DSP) is passing signal correctly. Ordinarily, if the DSP section passes signal normally in this static test mode, and if it passes the power-up self-test, then there is a high probability that it is performing the dynamic signal processing correctly. There is therefore no need to measure such things as attack and release times — these are defined by software, and will automatically be correct if the DSP is otherwise operating normally.

It is often more convenient to make measurements on the bench away from high RF fields which could affect results. In a high RF field it is, for example, very difficult to accurately measure the very low THD produced by a properly-operating 8282 at most frequencies. However, in an emergency situation (and is there any other kind?), it is usually possible to detect many of the more severe faults which could develop in the 8282 circuitry even in high-RF environments.



See the assembly drawings in Section 6 for component locations. Be sure to turn the power off before removing or installing circuit cards.

Follow these instructions in order without skipping steps.

There are some countries where regulatory authorities require peak output levels to not exceed a specified level when driving post office lines. Germany, for example, limits the level to 4.5Vpeak (+12.3dBu). The I/O CALIB CONTROL screen allows you to preset the peak output level (A-O 100% LVL dBu) produced by the processing in its normal operating mode. The absolute maximum output level in any test mode is 2.76dB higher than this. So, for example, German users should never preset the peak output level higher than +9.1dBu if they are driving post lines.

There are no tests in this procedure that require output levels above +10dBu. Users in countries with a +12.3dBu limit should therefore have no difficulty completing the tests.

(The maximum possible output level from the analog outputs is +24dBu, as determined by the clipping point of the 8282's line driver amplifiers.)

1. Prepare the unit.

A☐ Set the GROUND LIFT switch to CONNECT.

B☐ From the IDLE screen, press RECALL PRESET button to access the RECALL PRESET screen. (Press the soft key directly below the words "RECALL PRESET.")

C☐ Scroll to BY BYPASS.

D☐ Press RECALL& MODIFY button to put BY BYPASS on the air and access its screen controls.

> This test tone defeats all compression, limiting, and clipping, but retains all audio bandwidth-limiting filters (both analog and DSP) in-line.

E☐ Set the controls, as follows:

BYPASS GAIN dB	0
30Hz HPF	OFF

F☐ Press ESC to return to the IDLE screen.

G☐ Press SYSTEM SETUP button to access the SYSTEM SETUP screen. (Press the soft key directly below the words "SYSTEM SETUP.")

H☐ Press I/O CALIB button to access a detailed listing of all system calibrations.

I ☐ Set the controls listed below, as follows:

A-I CLIP LVL dBu	+10.0
A-I BAL R CH dB	0
A-O	FLAT
A-O 100% LVL dBu	+10.0

J ☐ Connect one 620Ω ±5% resistor between pin #2 and pin #3 of the L ANALOG OUTPUT XLR connector, and one 620Ω ±5% resistor between pin #2 and pin #3 of the R ANALOG OUTPUT XLR connector.

K ☐ Connect the audio voltmeter between pin #2 and pin #3 of the L ANALOG OUTPUT XLR connector.

L ☐ Connect the sine-wave oscillator to pins #2 and #3 of the 8282's L ANALOG INPUT XLR connector. Set the oscillator to 50Hz, and adjust its output level to produce a level of 2.45Vrms (+10dBu) at the L ANALOG OUTPUT XLR connector.

This level corresponds to 100% modulation.

M ☐ Disconnect the oscillator from the L ANALOG INPUT XLR connector, and connect it to the R ANALOG INPUT XLR connector.

N ☐ Disconnect the audio voltmeter from the L ANALOG OUTPUT XLR connector, and connect it between pin #2 and pin #3 of the R ANALOG OUTPUT XLR connector.

O ☐ Verify that the level at the R ANALOG OUTPUT XLR connector is 2.45Vrms (+10dBu).

P ☐ Disconnect the oscillator and audio voltmeter from the 8282.

2. Check frequency response.

If a tracking or sweep generator and spectrum analyzer are not available, the frequency response can be measured with an audio oscillator and N/D test set. If you will be doing this, ignore the rest of step 2, and instead: Connect the oscillator as in step 1-L, but reduce its output level by 20dB (to avoid overloading the 8282 at high frequencies). Connect the N/D test set to pins #2 and #3 of the 8282's L ANALOG OUTPUT XLR connector. Measure the frequency response with the oscillator set to 1kHz, then verify that response at 50Hz, 100Hz, 400Hz, 5kHz, 10kHz, and 15kHz is within ±0.5dB of that measured at 1kHz. Repeat for the right channel.

A ☐ Connect the output of a tracking or sweep generator to pins #2 and #3 of the L ANALOG INPUT XLR connector. Set the generator for a 20-20,000Hz logarithmic sweep.

B ☐ Connect the input of a spectrum analyzer or oscilloscope to pins #2 and #3 of the 8282's L ANALOG OUTPUT XLR connector.

C ☐ Adjust the output level of the tracking or sweep generator to obtain 0.33Vrms (–7.4dBu) or less at the 8282's output (to avoid clipping the 8282 at high frequencies because of pre-emphasis).

D ☐ Verify that the swept output is flat ±0.5dB from 50-15,000Hz.

E ☐ Disconnect tracking or sweep generator from the L ANALOG INPUT XLR connector, and connect it to the R ANALOG INPUT XLR connector.

F ☐ Disconnect the spectrum analyzer or oscilloscope from the L ANALOG OUTPUT XLR connector and connect it to the R ANALOG OUTPUT XLR connector.

G☐ Verify that the swept output is flat ±0.5dB from 50-15,000Hz.

H☐ Disconnect the tracking or sweep generator and the spectrum analyzer or oscilloscope from the 8282.

3. Check noise and distortion performance.

A☐ Connect a THD analyzer to the L ANALOG OUTPUT XLR connector. Set the THD analyzer's bandwidth to 80kHz.

B☐ Connect the oscillator to the L ANALOG INPUT XLR connector.

C☐ Set the oscillator's frequency to 1kHz and adjust its output level to produce 2.45Vrms at the 8282's L ANALOG OUTPUT XLR connector.

This level is equivalent to 100% modulation.

D☐ Verify that THD does not exceed 0.01%.

In many cases, measured results will be constrained entirely by the quality of the oscillator and distortion analyzer, and/or by the presence of RF fields.

E☐ Disconnect the THD analyzer from the L ANALOG OUTPUT XLR connector, and connect to the R ANALOG OUTPUT XLR connector.

F☐ Disconnect the oscillator from the L ANALOG INPUT XLR connector and connect to the R ANALOG INPUT XLR connector.

G☐ Repeat steps 3-C through 3-D for the right channel.

H☐ Disconnect the oscillator and THD analyzer from the 8282.

I ☐ Short the 8282's left and right inputs by connecting pins #2 and #3 of the L ANALOG INPUT XLR connector together, and by connecting pins #2 and #3 of the R ANALOG INPUT XLR connector together.

J ☐ Verify that the noise at the L ANALOG OUTPUT XLR connector and the R ANALOG INPUT XLR connector is below –70dBu (80dB below 100% modulation).

Note that hum or buzz due to test equipment grounding problems and/or high-RF fields may result in falsely high readings. Such problems should become immediately apparent if the output of the THD analyzer is monitored with an oscilloscope.

K☐ Remove the shorting jumpers from the 8282's inputs.

4. Return OPTIMOD-TV to service.

A☐ Remove the 620Ω resistors connected across the output in step 1-J.

B☐ Recall your normal operating preset.

Field Alignment

The only card requiring calibration is the Analog Input/Output Card (Card #1). Because the calibration procedure compensates only for the accumulated tolerances of stable metal film resistors used in the circuitry, calibration is usually done once at time of manufacture, and is very unlikely to be required again over the life of the equipment. These field alignment instructions are therefore included primarily for reference — *routine alignment is neither necessary nor desirable* due to the high stability of the circuitry.

Required Equipment

- Ultra-low distortion sine-wave oscillator/THD analyzer/audio voltmeter

  (With verified residual distortion below 0.01%. Sound Technology 1710B; Audio Precision System 1, or similar high-performance system.)

  (The **NAB Broadcast and Audio System Test CD** is an excellent source of test signals when used with a high-quality CD player.)

- Spectrum analyzer with tracking generator, 30-30,000Hz range, or other means of measuring swept frequency response over this range

  Tektronix 5L4N plug-in with 5111 bistable storage mainframe, Audio Precision System One.

- Digital voltmeter

  Accurate to ±0.1%

- Oscilloscope

  DC-coupled, triggered-sweep, with 5MHz or greater vertical bandwidth.

  It is assumed that the technician is thoroughly familiar with the operation of this equipment.



CAUTION

If calibration is necessary, we *strongly recommend* that the circuit card in question be returned to the factory for calibration by our experienced technicians. They have access to special test fixtures and a supply of exact-replacement spare parts. Only in an emergency should you attempt to align and calibrate the 8282 in the field.

Follow these instructions in order, without skipping steps.

Refer to the drawings in Section 6 for locations of components and test points.

Prepare the Unit

1) Set the GROUND LIFT switch to CONNECT.

2) Remove the 8282 from its rack and place it on a test bench *away from RF fields.*

3) Open up the 8282's front panel.

See page 4-3 for instructions.

4) Set the AC POWER switch to ON.

Allow the 8282 to finish its diagnostic routine before proceeding.

Test Power Supplies (Optional)

1. Test ±12 volt supply (Display Board).

A☐ Measure the +12 volt supply with the DVM. Verify the presence of 12 volts (±0.75V).

The +12 volt supply appears between the positive lead of C301 and ground on the Display Board.

B☐ Using the oscilloscope, measure the total ripple and noise on the +12 volt supply.

The ripple and noise should not exceed 75mVp-p.

C☐ Measure the −12 volt supply with the DVM. Verify the presence of −12 volts (±0.75V).

The −12 volt supply appears between the negative lead of C302 and ground on the Display Board.

D☐ Using the oscilloscope, measure the total ripple and noise on the −12 volt supply.

The ripple and noise should not exceed 50mVp-p.

2. Test Digital +5 volt supply (Display Board).

A☐ Measure the +5 volt supply with the DVM. Verify the presence of 5 volts (±0.25V).

The +5 volt digital supply appears between the positive lead of C300 and ground on the Display Board.

B☐ Using the oscilloscope, measure the total ripple and noise on the +5 volt digital supply.

The ripple and noise should not exceed 50mVp-p.

C☐ Set the 8282's AC POWER switch to OFF.

3. Test ±15 volt supply (Analog I/O Card).

A☐ Make sure that the 8282's AC POWER switch is OFF.

B☐ Remove Card #1 from its slot, insert an extender card (included with your 8282) into slot #1, then insert Card #1 into the extender card.

C☐ Set the AC POWER switch to ON.

Allow the 8282 to finish its diagnostic routine before proceeding.

D☐ Measure the +15 volt supply with the DVM. Verify the presence of 15 volts (±0.75V).

The +15 volt supply appears between TP11 and ground test point TP7 on Card #1 (Analog I/O Card).

E☐ Using the oscilloscope, measure the total ripple and noise on the +15 volt supply.

The ripple and noise should not exceed 100mVp-p.

F☐ Measure the −15 volt supply with the DVM. Verify the presence of 15 volts (±0.75V).

The −15 volt supply appears between TP10 and ground test point TP7 on Card #1 (Analog I/O Card).

G☐ Using the oscilloscope, measure the total ripple and noise on the −15 volt supply.

The ripple and noise should not exceed 100mVp-p.

4. Test Local ±5 volt supply (Analog I/O Card).

A☐ Measure the +5 volt supply with the DVM. Verify the presence of 5 volts (±0.25V).

The +5 volt supply appears between TP6 and ground test point TP7 on Card #1 (Analog I/O Card).

B☐ Using the oscilloscope, measure the total ripple and noise on the +5 volt supply.

The ripple and noise should not exceed 100mV.

C☐ Measure the −5 volt supply with the DVM. Verify the presence of 5 volts (±0.25V).

The −5 volt supply appears between TP8 and ground test point TP7 on Card #1 (Analog I/O Card).

D☐ Using the oscilloscope, measure the total ripple and noise on the −5 volt supply.

The ripple and noise should not exceed 100mV.

Calibrate and Test Card #1 (Analog Input/Output Circuitry)

1. Prepare for test.

A☐ If Card #1 is not ready for testing (inserted in an extender card in slot #1), turn AC POWER switch to OFF, remove Card #1 from its slot, insert the extender card into slot #1, then insert Card #1 into the extender card.

B☐ Make sure that the 8282's AC POWER switch is ON.

Allow the 8282 to complete its diagnostic routine.

C☐ From the IDLE screen, press RECALL PRESET button to access the RECALL PRESET screen. (Press the soft key directly below the words "RECALL PRESET.")

D☐ Scroll to TO USER TONE.

E☐ Press RECALL& MODIFY button to put TO USER TONE on the air and access its screen controls.

F☐ Set the controls, as follows:

FREQUENCY Hz	400Hz
MODULATION LEVEL %	100%
MODULATION TYPE	L+R

This test tone applies a digitally-generated 400Hz sinewave at exactly 100% modulation to the 8282's D/A converters.

G☐ Press ESC to return to the IDLE screen.

2. Calibrate reconstruction filter gains.

A☐ Connect the audio voltmeter/THD analyzer between circuit ground and TP3 on Card #1.

B☐ Adjust trimpot R175 (LEFT GAIN TRIM) so that the audio voltmeter indicates +12.6dBu ±0.1dBu.

C☐ Connect the audio voltmeter between TP3 and TP9.

The voltmeter must have an accurately balanced, differential input. A portable battery-powered DVM (digital voltmeter) is ideal for this test because its common-mode rejection is essentially infinite.

D☐ Adjust trimpot R177 to null the meter reading.

Increase the sensitivity of the meter as necessary. The null should be very deep (typically 60dB or better).

3. Test frequency response of reconstruction filters (Optional).

A☐ From the IDLE screen, press RECALL PRESET button to access the RECALL PRESET screen. (Press the soft key directly below the words "RECALL PRESET.")

B☐ Scroll to TO USER TONE.

C☐ Press RECALL& MODIFY button to put TO USER TONE on the air and access its screen controls.

D☐ Set the controls, as follows:

FREQUENCY Hz	400Hz
MODULATION LEVEL %	0%
MODULATION TYPE	L+R

This test tone applies a digitally-generated 400Hz sinewave at 0% modulation to the 8282's D/A converters. The result is no signal being applied to the reconstruction filters.

E☐ Press ESC to return to the IDLE screen.

F☐ Connect the sweep tone generator output of a spectrum analyzer or test set to TP13. Set the sweep range from 20Hz to 150kHz.

This applies a swept sine wave input signal to the left channel reconstruction filter.

G☐ Adjust the sweep tone level to 2.12 volts peak or less.

H☐ Connect the spectrum analyzer input to TP3.

I ☐ Verify that the frequency response is a low pass type. It should have a peaked response of +0.35dB at 24kHz and +0.25dB at 15kHz.

J ☐ Connect the sweep tone generator output to TP15 and the spectrum analyzer input at TP9.

This applies a swept sine wave input signal to the right channel reconstruction filter.

K☐ Repeat steps 3-H through 3-I for the right channel, then continue to step 3-L.

L ☐ Set the 8282's AC POWER switch to OFF.

M☐ Remove Card #1 from the extender card, remove the extender card from slot #1, then re-insert Card #1 into its slot.

Return OPTIMOD-TV to Service

1) Disconnect all test instruments from the 8282.

2) Set the AC POWER switch to OFF.

3) Set the AC POWER switch to ON.

4) Close front panel.

See page 4-3 for instructions.

5) Return the 8282 to its rack and reconnect it.

6) After the 8282 has been powered from the AC line, recall the desired operating preset, either locally or by remote control.

If you recall presets by the 8282's internal automation, be assured that this function will start working as soon as you apply AC power. The next programmed preset will be recalled at the programmed time for that preset.