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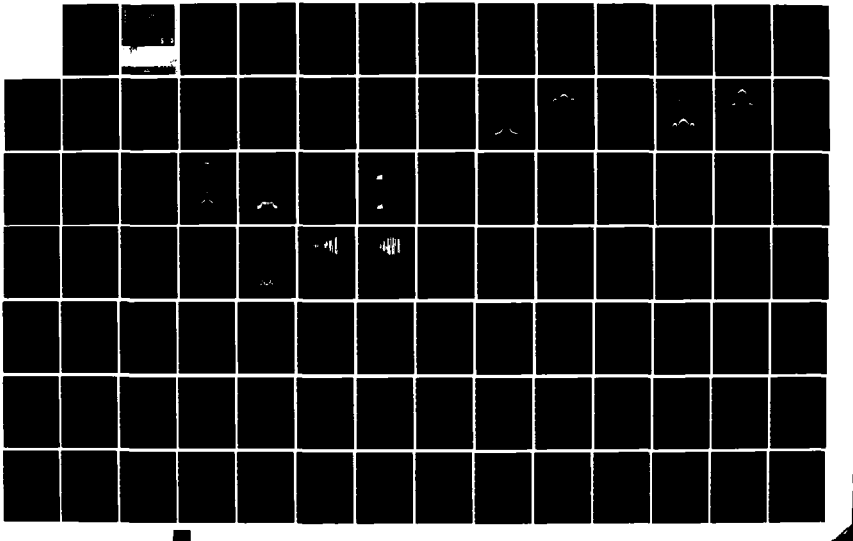

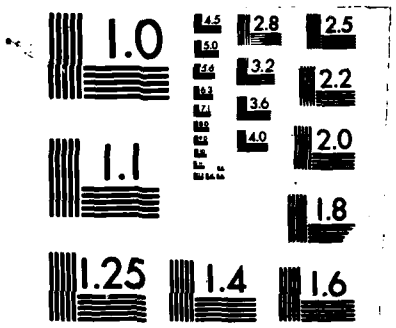

FLEXIBLE SATELLITE COMMUNICATIONS SYSTEMS SIMULATOR

PHASE III — FINAL REPORT

PREPARED FOR
THE DEFENSE COMMUNICATIONS AGENCY
WASHINGTON, D.C.

UNDER
CONTRACT DCA100-77-C-0020

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This is a final report detailing the enhancements to FSCSS made during Phase III. It contains a description of the work performed and the acceptance tests conducted to demonstrate the FSCSS enhancements. Test results are discussed and analyzed.

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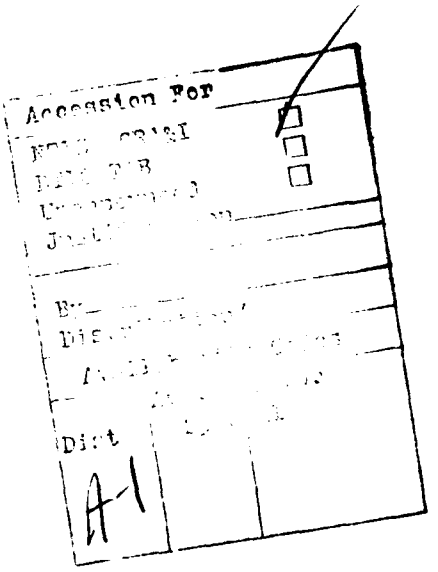

CSC
COMPUTER SCIENCES CORPORATION
SYSTEMS DIVISION

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SECTION 1 - INTRODUCTION AND SUMMARY

This FSCSS Phase III Final Report describes the work performed during Phase III of Contract DCA100-77-C-0020. The work reported here includes the implementation of additional features of the Flexible Satellite Communications Systems Simulator (FSCSS), the Phase III acceptance tests and the documentation of the FSCSS Version 3.0 software.

The work performed during Phase III falls into the following five categories:

1. Enhancements to the input process;
2. Addition of a color graphics capability;
3. Enhancements to the output process;
4. Simulation capabilities enhancements; and
5. New devices.

Additional keywords: digital Simulation; digital computers; user friendliness; graphics terminals and printers

The main thrust of the enhancements to the input process was to improve the user-friendliness of FSCSS. This consisted of simplifying the process of creating and editing devices, elements and systems. A single edit command, rather than three separate commands, is now used. In addition, new subcommands were added to the element and system editing modes.

A Tektronix color graphics terminal and printer were purchased for FSCSS as part of the Phase III effort. Programs were written that provide the capability to produce block diagrams of elements and systems in the FSCSS data base. The capability to plot tabular output data from the FFT and demodulator measurement devices was also added.

Output was made into an independent process with its own data base. All output report processing is done at the FSCSS command/subcommand level, so the user no longer needs to use VAX commands. A report definition subcommand has been added through which the user can select or deselect the printout of reports from

measurement devices activated during run parameter specification. A plot subcommand is also available through which the user can obtain high resolution plots of any activated FFT or any of eight types of x-y plots for activated demodulator measurement devices.

Simulation capabilities enhancements were incorporated to reduce simulation execution time, increase the range of allowable data rates, extend the demodulator signal-to-noise ratio estimate capability to all demodulators, adjust the sampling rate in frequency sample filters so that all filter bandwidths are allowable, and provide a time-window capability for all measurement devices.

New devices were added to FSCSS and several existing devices were modified; namely:

1. PN and FH spreaders
2. Remodulation of signals demodulated in a satellite element
3. Synchronous and block interleavers
4. Synchronous and block deinterleavers
5. Poles and zeros filter
6. Atmospheric effects update
7. Soft-decision decoding extension to additional modulation schemes
8. Phase noise generator enhanced
9. Time sample storage and reuse
10. Nuclear effects

All these devices work except for minor problems in certain modes of operation of the interleavers and atmospheric effects devices. These will be analyzed and corrected during the maintenance phase of the contract. Problems left unresolved at the end of Phase II (e.g., phase noise effects) have been corrected.

Section 2 lists the reference documents supporting this report. Section 3 describes the work accomplished under FSCSS Phase III and summarizes the results of engineering testing and the acceptance tests.

Section 4 presents and analyzes the results of the Phase III Stage 2 acceptance tests performed in the period March 18, 1985 to April 1, 1985 and is supported by Appendix A, which contains the data sheets filled out for each test and signed by witnessing DCEC and CSC personnel. The FSCSS devices, elements and systems used for all these tests are characterized in Appendix B.

Section 5 summarizes the state of FSCSS at the end of Phase III.

SECTION 2 - REFERENCE DOCUMENTS

This FSCSS Phase III Final Report is supported by the following references:

1. Flexible Satellite Communications Systems Simulator, Phase 1A Final Report, 1 July 1979.
2. Flexible Satellite Communications Systems Simulator, Phase II Interim Report, August 1983.
3. Flexible Satellite Communications Systems Simulator, Stage 2 Demonstration Plan, 8 July 1983.
4. Flexible Satellite Communications Systems Simulator, Demonstration 4 Report, August 1983.
5. Flexible Satellite Communications Systems Simulator, Demonstration 5 Report, March 1984.
6. Flexible Satellite Communications Systems Simulator, Phase II Final Report, March 1984.
7. Flexible Satellite Communications Systems Simulator, Phase III Communications Enhancement Design Plan, November 1984.
8. Flexible Satellite Communications Systems Simulator, Nuclear Effects Code Interface Report, October 1984.
9. Flexible Satellite Communications Systems Simulator, Users Guide, March 1984.
10. Flexible Satellite Communications Systems Simulator, Standard Device Groups, March 1984.
11. Flexible Satellite Communications Systems Simulator, Maintenance Manual, March 1984.

12. Paul, H. and Kullstam, P., "Effects of Phase Noise and Thermal Noise Upon Coherent PSK Demodulation ...," Task Order 0208, Contract DCA100-73-C-0008, August 1974.

13. Gardner, F.M., "Phaselock Techniques," Wiley, 1966.

14. Kullstam, P., "Comparison of Three Basic Methods to Operate in Presence of Doppler Stress...," Paper 74-438, AIAA 5th Communications Satellite Systems Conference, April 1974.

15. Final Report on Increased Channel Bandwidth Study, CDRL #A072, General Electric Company, March 1981.

16. Proakis, J.G., "Digital Communication," McGraw Hill, 1983.

SECTION 3 - DESCRIPTION OF PHASE III ENHANCEMENTS

3.1 INTRODUCTION

During Phase III various enhancements were made to FSCSS. The input and output processes were modified to provide improved user-friendliness and great flexibility. The simulation process was enhanced to reduce simulation run time and to provide expanded simulation capabilities and results. New devices were added to the modeling capabilities, and a color graphics system was incorporated that provides the capability for higher resolution plots of Fast Fourier transforms and x-y plots of demodulator statistics. These enhancements are described in the following paragraphs.

3.2 ENHANCEMENTS TO THE INPUT PROCESS

The FSCSS input process has been modified so that the single command EDIT is used for device, element and system creation. It is no longer necessary to use a different command (i.e., EDDV, EDEL, and EDSV). The EDIT command operand specifies which editing mode is to be entered. The element editing mode has also been expanded to provide the capability to create new devices while inserting or replacing devices.

A DRAW elements and systems command has been added that produces block diagrams on a color graphics terminal and printer. The screens have titles and subtitles, with system or element descriptor and the FSCSS entity name (e.g., SY45), respectively, as optional defaults. A default color scheme has been provided which the user can change using the graphics terminal function keys. The DRAW capability has also been provided as a subcommand in the element and system edit modes.

3.3 SIMULATION CAPABILITIES ENHANCEMENTS

3.3.1 Time Required for a Simulation

Simulation execution time is, among other things, a function of array processor memory size and the number of calls to the array processor. To reduce execution time, vector chaining of array processor commands was incorporated where applicable. Vector chaining reduces the number of calls to the array processor by sending certain array processor operations as a group in one call. In particular, this reduces the processing time of filters by a factor of two to four.

3.3.2 Increased Range of Allowable Data Rates

The FSCSS global sampling frequency is determined by the number of carriers included in a simulation, the bandwidth of these and the data rates. In turn, symbol rate divided by sampling frequency determines the number of samples per channel symbol. For the highest data rate in a configuration, this number must be at least equal to the minimum number of samples per symbol specified in the run parameters. For a lower data rate this number would be higher. In the Phase II FSCSS (Version 2.0), there was an upper limit on the number of samples per channel symbol. This limited the lowest data rate that could be simulated. The limit has been removed so that any data rate can be simulated.

3.3.3 Demodulator Signal-to-Noise Ratio Estimate

FSCSS contains a capability within the demodulator measurement device to estimate symbol error rate based on the signals at the detector output. This device calculates a running average of what might be termed the instantaneous error rate. At the end of a simulation, it produces a demodulator performance curve based on the addition of extra thermal noise to whatever degradation was present during the simulation. The algorithm used is not valid for other than white Gaussian noise interference. It

does, however, produce a reasonable performance estimate in a short simulation time (five or ten sample blocks). In contrast, the accurate measurement technique is to count bit errors, which may take many days of simulation time for an error rate of 1 in 10,000.

An additional capability to estimate signal and "noise" level at the demodulator input was implemented in all demodulators except APSK. The new algorithm bases these estimates on the mean and variance of the demodulator output signals. The agreement with measured bit error rates is much better with this new algorithm than with the old. For comparison, both old and new results are provided in the FSCSS "CSER" output.

3.3.4 Sample Rate Adjustment in Frequency Sample Filters

The FSCSS model for frequency sample (FS) filters is a finite impulse response algorithm. The user's 30 or fewer frequency domain points are extended across the full simulation bandwidth, and a z-transform is calculated. Storage is provided for only 500 points, which unrealistically limits the allowable lower bandwidth of the filter if the simulation bandwidth is high. To remedy this situation, a down-sampling technique has been incorporated. The sampling rate at the input to the filter is reduced by factors of two until it is just greater than the global sampling frequency (F_s) divided by four times the filter's 3-dB bandwidth ($F_s/4B$). This guarantees that the number of impulse response samples is 500 or less. The sampling rate is restored at the filter output by duplicating samples as necessary.

3.3.5 Time-Windowed Measurement Capability

All FSCSS measurement devices have been modified to provide time windows. Output reports may be produced for each window and for the entire simulation. Power meters can have up to ten windows, and the other measurement devices can have two.

3.3.6 Output Process Enhancements

The FSCSS output process has been reorganized so that all reports and plots are generated using FSCSS commands, rather than VAX command language. Upon completion, suspension or cancellation of a run, output data is automatically stored in the output data base labeled with a unique FSCSS run identifier. Using the OUTPUT command, the user can custom tailor the output reports to be printed or obtain reports for all measurement devices activated for that simulation. FSCSS diagnostic messages for the simulation can also be displayed.

Graphical output of the FFT and demodulator reports are obtained through the color graphics terminal and its associated printer. A plot definition subcommand is provided that allows the user to change plot colors, grid lines, title, and subtitle. Additionally, the frequency range of FFT plots can be varied to allow focusing on particular areas of the spectrum.

The nine types of plots that have been provided are:

1. FFT
2. Computed symbol error rate
3. Inphase channel voltage
4. Quadrature channel voltage
5. Symbol phase versus symbol count
6. Carrier phase versus symbol count
7. Phase error versus symbol count
8. Frequency estimate versus symbol count
9. Frequency rate estimate versus symbol count.

3.4 NEW DEVICES

3.4.1 PN and FH Spreaders

Pseudonoise (PN) and frequency hopping (FH) spreader devices were added that provide the capability to spread previously modulated signals. In the case of FH, orthogonal hopping was

added as an option in the spreader and despreader. In addition, the orthogonal hopping option was added to all FH and PN/FH modulators and demodulators.

3.4.2 Remodulation in a Satellite Element

The capability to remodulate a signal demodulated in a satellite element was incorporated. All modulators were modified to accept data bits output by demodulators, decoders and bit error rate counters.

3.4.3 Convolutional and Block Interleavers

Convolutional and block encoders capable of bit and symbol interleaving were added to FSCSS to operate with FSK modulators and demodulators. The block interleavers also have a block repetition option for up to 15 repetitions.

3.4.4 Convolutional and Block Deinterleavers

Convolutional and block decoders capable of bit and symbol deinterleaving for hard or soft decision decoding have been added to FSCSS. The FSK demodulator device was modified to output symbols or symbol voltages (for soft-decision decoding) which are passed on to the deinterleaver. For alphabet sizes greater than two, a symbol-to-bit converter must be used after the deinterleaver to convert the symbols to bits or bit voltages.

3.4.5 Poles and Zeros Filter

A poles and zeros filter device was added to model arbitrary filters and, in particular, elliptic filters. The poles and zeros are input by the user. The poles and zeros device uses these input values to calculate a residue for each of the pole locations. An existing FSCSS routine then uses the poles and residues to generate the recursive filter algorithm parameters that model the filter.

3.4.6 Atmospheric Effects

The atmospheric effects algorithms in FSCSS were updated with newer, more refined models. In particular, the rain attenuation model was changed. The new one includes depolarization losses in the rain attenuation calculation. An algorithm was also added to model the interference effects between links using orthogonally polarized antennas for frequency reuse. The atmospheric absorption model was changed to the new CCITT accepted model. Lastly, the atmospheric absorption, cloud attenuation, and rain attenuation algorithms were modified to accept elevation angles of less than six degrees.

3.4.7 Soft-Decision Viterbi Decoding

Soft-decision Viterbi decoding has been extended to DPSK, M-FSK, FH, PN/FH and MSK modulated signals. Briefly, the task consisted of modifying the demodulators to provide detector output voltages, and adding a symbol-to-bit converter device for 4-, 8- and 16-FSK. The function of the symbol-to-bit converter is to determine the most likely received symbol and then assign the demodulator output voltage to each of the bits of that symbol. The Viterbi algorithm decoder then performs soft-decision decoding on the bits.

3.4.8 Phase Noise Generator

The frequency translator phase noise generator was modified to accept up to 50 spectral points. In addition, an option has been provided whereby the user can enter the phase noise power spectrum coefficients (H_i) instead of the frequency samples, where the spectrum is given by

$$S(f) = H_0 + H_1/f + H_2/f^2 + H_3/f^3.$$

In this latter case, FSCSS calculates the 50 samples from the coefficients. The greater number of samples allows for a more

accurate representation of the spectrum both within and outside the bandwidth of a demodulator phase lock loop.

3.4.9 Time Sample Storage and Reuse

A device (KEEPSAMPLES) was added to FSCSS to save time samples of a composite signal in a disk file. In addition, the noise source device was expanded to accept external noise files. The saved samples can then be reused in simulations as noise sources -- signals not to be demodulated.

3.4.10 Nuclear Effects

An algorithm that models ionospheric scintillation disturbances caused by high-altitude nuclear detonations has been added to the FSCSS Propagation Anomalies device. The model, described in Reference 8, is based on L. Wittwer's Channel Impulse Response Function (CIRF).

3.5 DOCUMENTATION UPDATES

As part of the Phase III effort, the FSCSS User's Manual and the FSCSS Maintenance Manual were updated to reflect the new devices and enhancements. Final versions of the manuals were delivered in April 1985.

SECTION 4 - FSCSS PHASE III ACCEPTANCE TESTS

4.1 INTRODUCTION

This section describes the Phase III acceptance tests designed to demonstrate the correct operation of the Phase III enhancements as described in Reference 7. The tests fall into eight categories:

- Spreaders and Despreaders
- Poles and Zeros Filters
- Block and Synchronous Interleavers
- Soft Decision Viterbi Decoding for MSK, DPSK, FSK, FH and PN/FH
- Phase Noise Enhancements
- Storage and Reuse of Signal Samples
- Atmospheric Effects
- Nuclear Effects
- Execution Time Reduction

The input, output and simulation capabilities enhancements were demonstrated during the process of running the acceptance tests, rather than as separate tests. In particular, the plotting routines were used routinely in most tests to show FFT plots and demodulator performance. Element and system block diagrams obtained through the graphics terminal were used to illustrate the configurations being tested.

The following paragraphs present and analyze the results for all tests performed. Appendix A contains the test worksheets showing the configurations and the results. Each test sheet shows a block diagram, the major device parameters and how the required operating point was set. Appendix B contains device parameter sheets for each test configuration and includes block diagrams obtained using the DRAW command.

Two proposed tests were not run: one to demonstrate execution time speedup (Test 1), and the other to demonstrate synchronous interleaving/deinterleaving of a convolutionally encoded/soft-decision decoded data stream using FSK modulation (Test 6).

Test 1 was to consist of a rerun of the DEMO 5 system (Reference 5), which contains many vector chained devices (e.g., filters and limiters). Execution times measured for various phases of the run (device initialization and presimulation) would then be compared to times documented in Reference 5. Unfortunately, time did not permit reconstruction of this complex demonstration system; and another suitably benchmarked system was not available for comparison. However, based upon results of early tests of vector chained devices, execution times are notably faster, particularly in connection with filter devices. A three-to-one speedup was measured for a filter intensive configuration.

Test 6 was not run because of problems encountered in using interleavers with other encoders and decoders. Instead, soft-decision Viterbi algorithm decoding of FSK modulated signals was included as part of Test 7 (7D) in which soft-decision decoding was demonstrated for various modulation schemes.

4.2 PN AND FH SPREADERS AND DESPREADERS (TEST 2)

This test is intended to validate the simulation of PN and FH spreaders and despreaders. A BPSK waveform was used as the narrowband signal to be spread. This signal was then frequency hopped (spread) and direct sequence spread in the same transmit element using parallel transmission paths. Then, these waveforms were despread before being demodulated. A perfect, phase-coherent carrier reference was used, achieved by acquiring the reference using a noiseless preamble in the device initialization phase and then using a very narrow tracking loop bandwidth in the simulation phase.

The results of this test can be found on page A-1. The FFT measurements taken before spreading and after FH and DS spreading can be found in Figures 4-1 through 4-3. Figure 4-4 gives the CSER calculation for the PN demodulator. These figures show that FSCSS is accurately modeling both PN and FH spreaders. The spread spectrum bandwidth for both types of spreaders is as expected. It is proportional to the baseband bandwidth hopped over the number of cells specified for the FH spreader and to the chipping rate in the PN case. The FH spreader hopping cells were intentionally chosen wider than necessary so that the hopping of the BPSK signal would be clearly visible. Demodulation of the BPSK signals after despreading yielded the expected 0 bit error rates, indicating that the spreaders introduced no performance degradation and, thus, operate correctly.

4.3 POLES AND ZEROS FILTERS (TEST 3)

This test is intended to verify the operation of the FSCSS poles and zeros filter. This filter allows one to model an arbitrary filter by specifying normalized pole and zero locations, a 3-dB bandwidth, and the center frequency.

In order to verify correct operation of the filter, a poles and zeros (P-Z) filter was inserted into the wideband portion of the PN channel used in the previous test. This filter was modeled using pole and zero locations obtained from Reference 15, Case #211, and a 3-dB bandwidth such that all but the main lobe of the PN signal would be filtered out.

The results of this test can be found on page A-2. Figures 4-5 through 4-7 show the FFT plots, and Figure 4-8 shows the CSER measurements for the PN-channel BPSK demodulator.

Based on the above graphical output, there seems to be little doubt that FSCSS is accurately modeling P-Z filters. The rolloff and bandwidth of the filter agree with the general shape of the filter specified in the Reference 15.

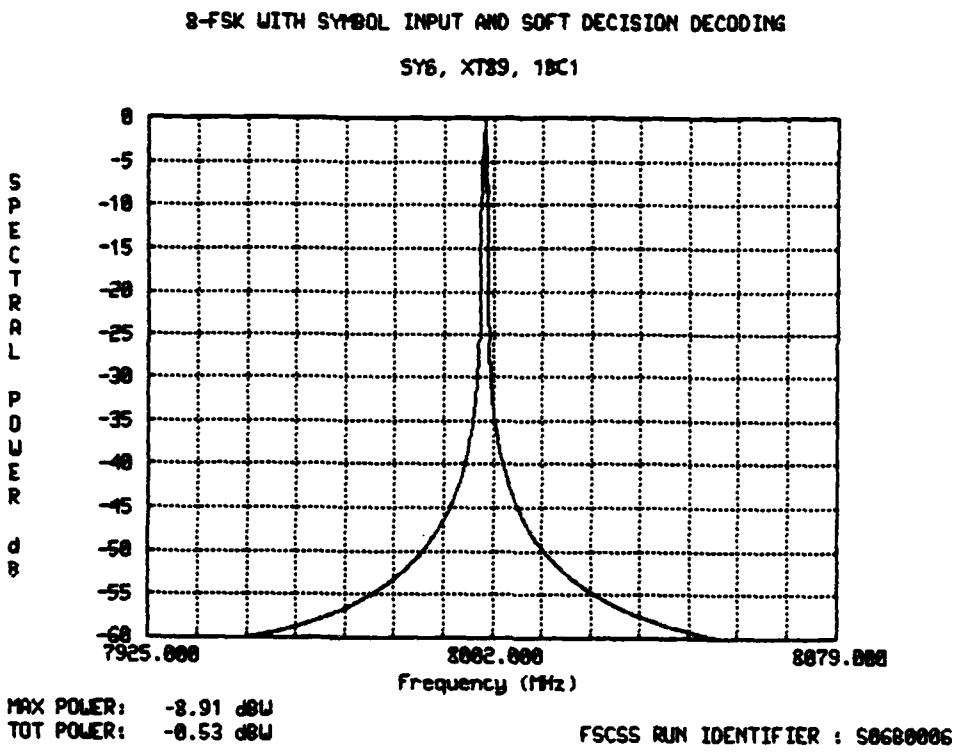


Figure 4-1. Narrowband BPSK Signal

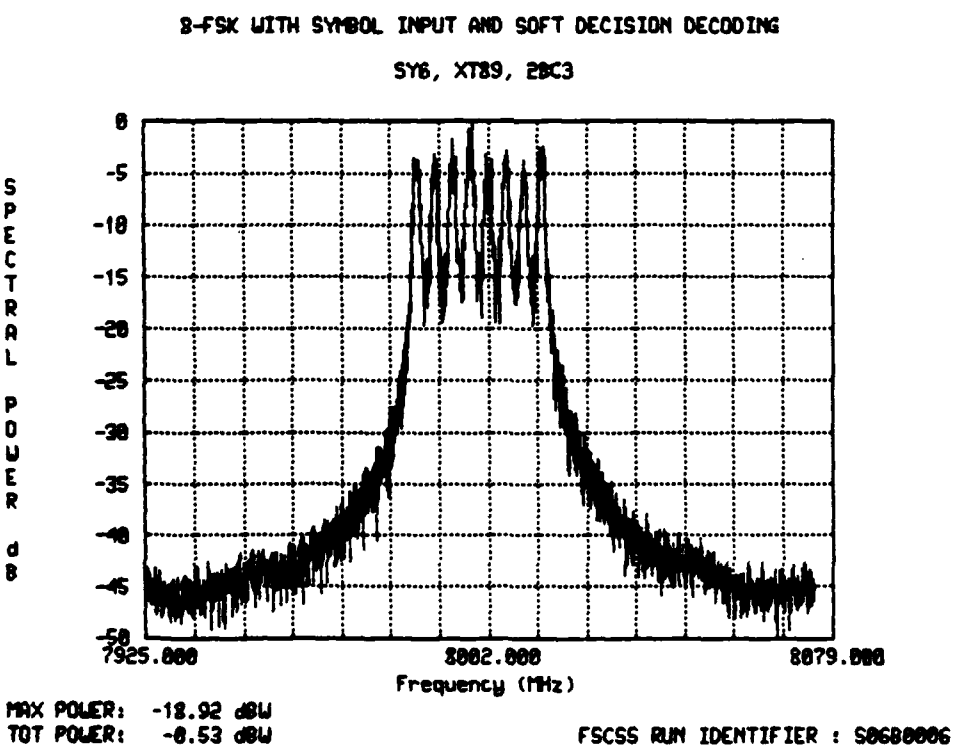


Figure 4-2. FH Spread Spectrum Signal

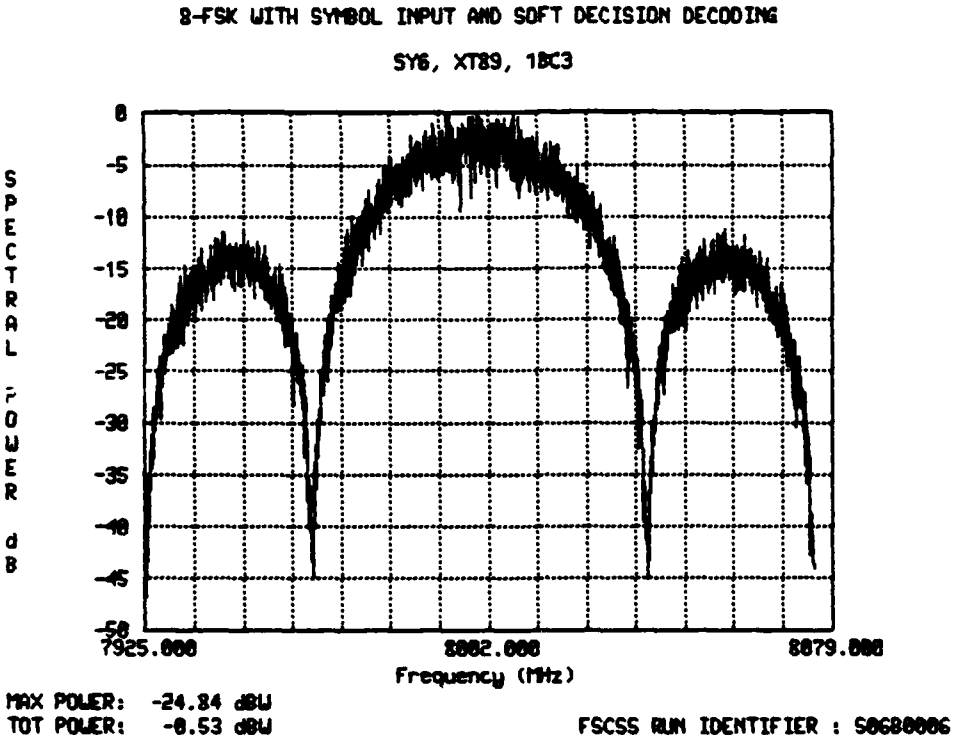


Figure 4-3. DS Spread Spectrum Signal

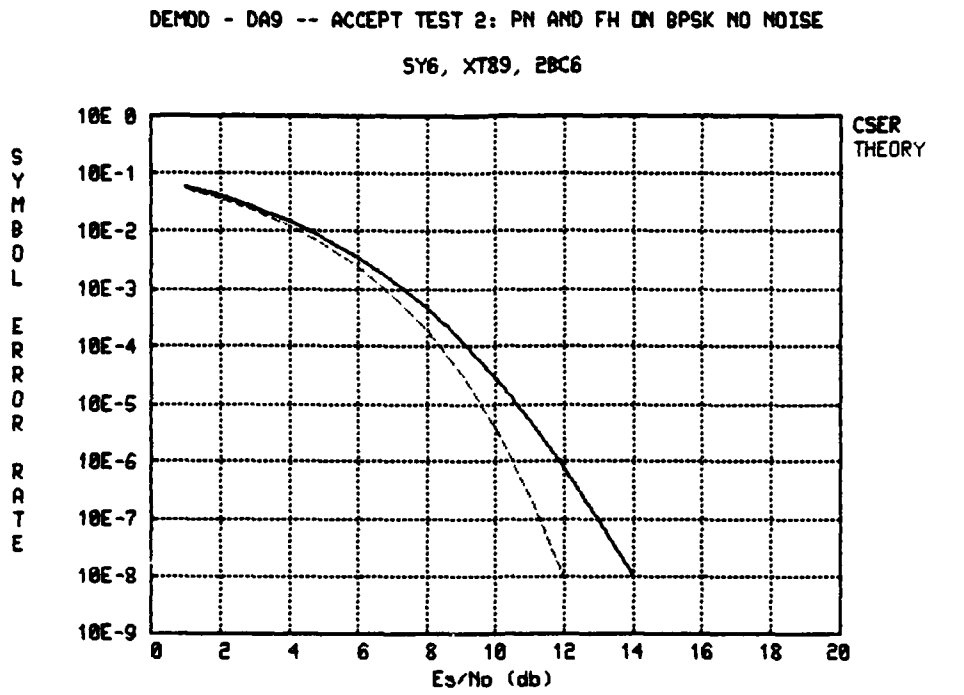


Figure 4-4(a). CSER Output

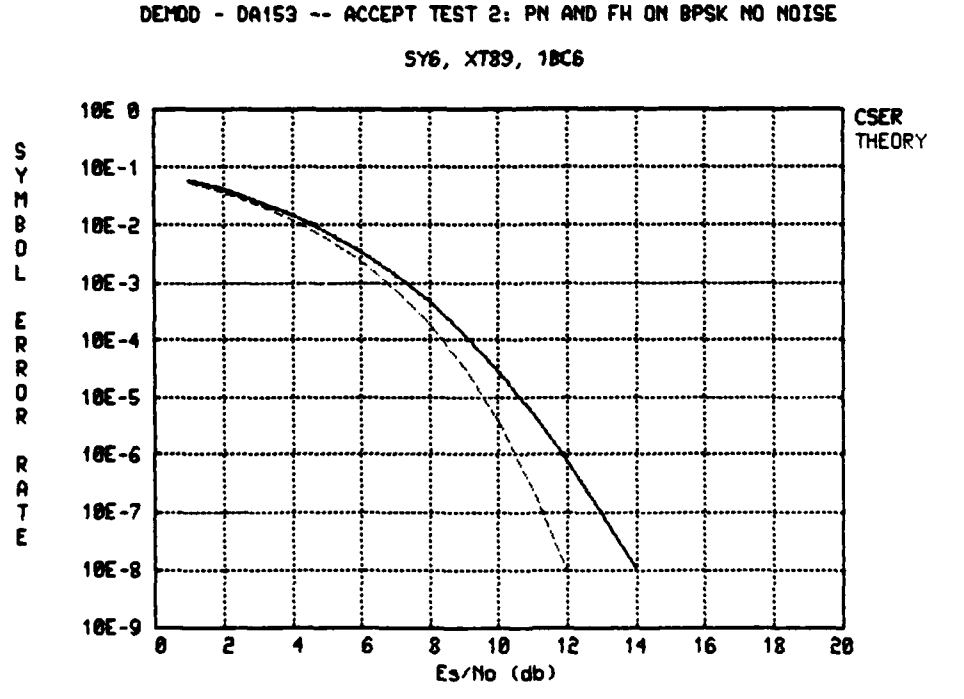


Figure 4-4(b). CSER Output

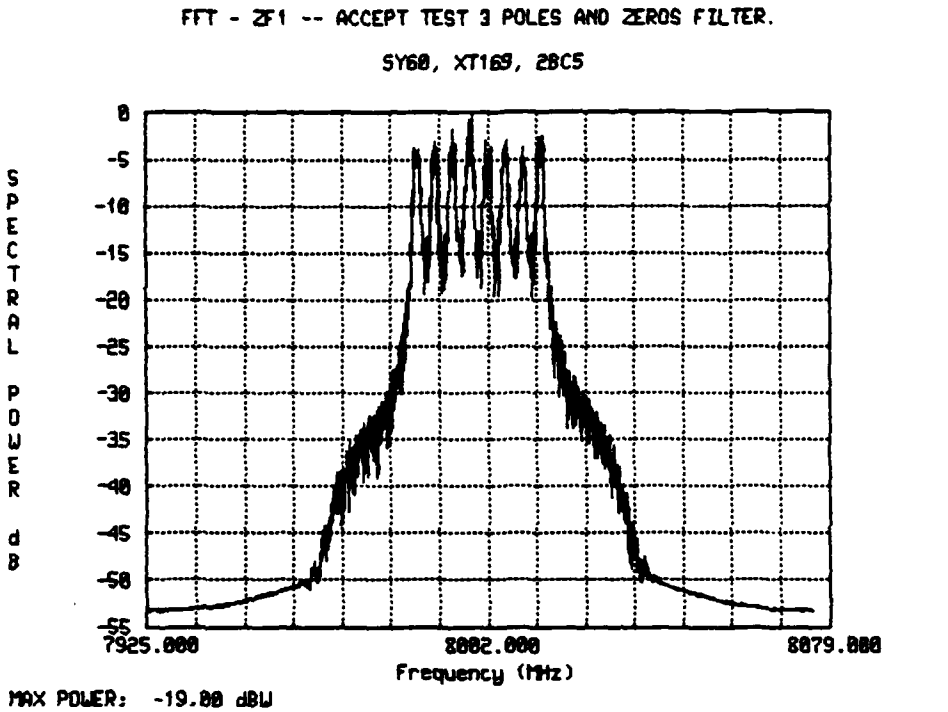


Figure 4-5. FFT for FH after P-Z Filter

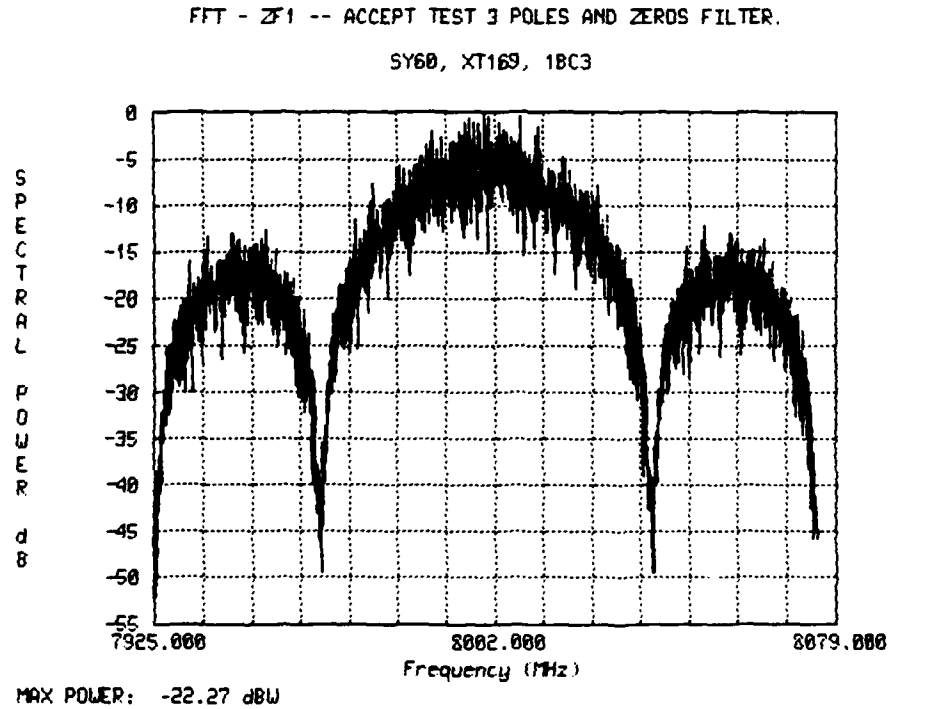


Figure 4-6. FFT for PN before P-Z Filter

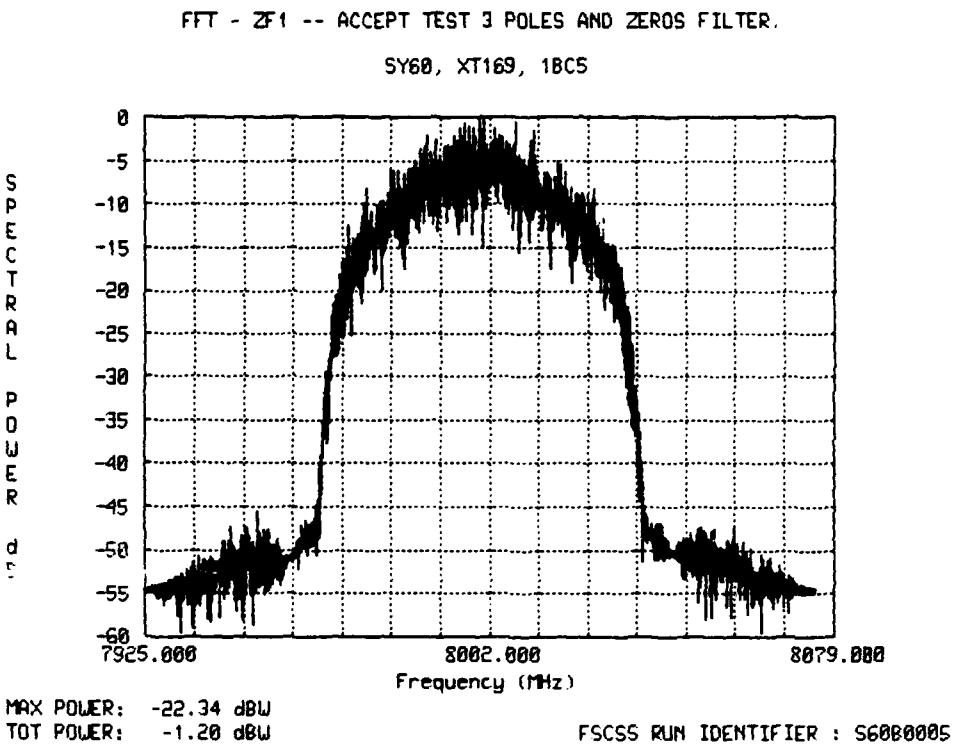


Figure 4-7. FFT for PN after P-Z Filter

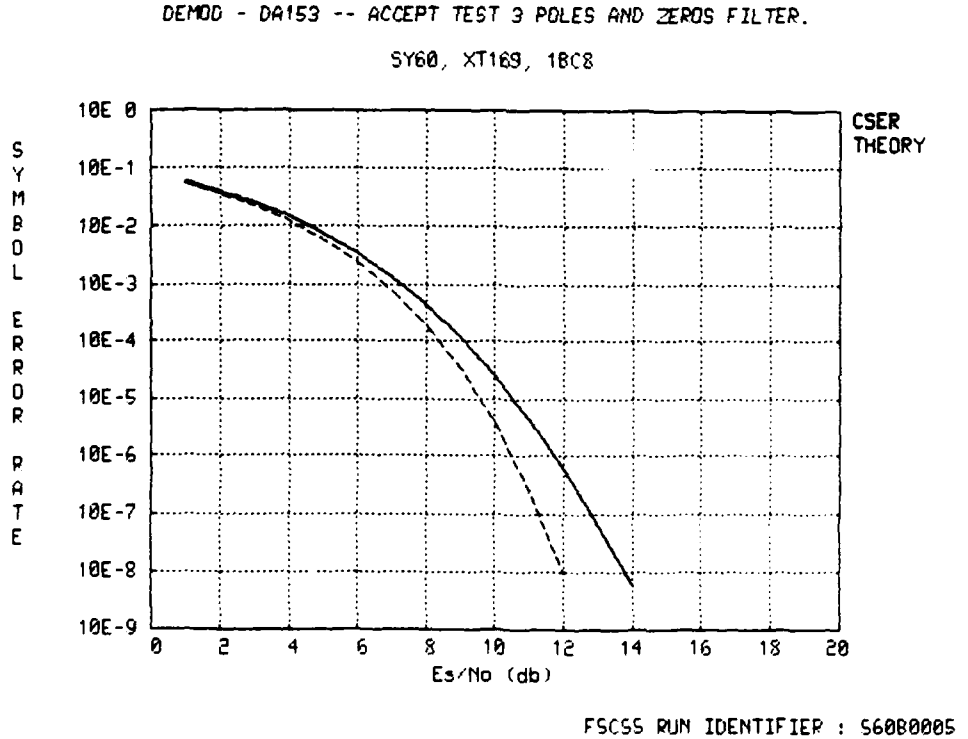


Figure 4-8. CSER: PN Channel

4.4 BLOCK INTERLEAVERS (TEST 4)

The purpose of this set of tests is to verify the operation of the block interleavers with both bit and symbol inputs. Unfortunately, as discussed in Section 3, the block interleaver is not currently accepting symbol inputs. This situation will be corrected during the FSCSS maintenance phase.

The bit-input block interleaver test results are shown on page A-3. A small interleaver size (8x32) was chosen to minimize the FSCSS run time. The test configuration contained two Bit Error Rate (BER) counters -- one associated with the interleaver and one with the data source. Thus, the error rate out of the demodulator (due to the channel) could be verified as well as the error rate (end-to-end) of the entire configuration. The 0 BER measured in both cases indicates that the FSCSS block interleaver is working correctly for bit inputs and outputs (hard decision).

4.5 SYNCHRONOUS INTERLEAVERS (TEST 5)

The purpose of this set of tests is to verify the operation of the FSCSS synchronous interleaver. Again, a problem was uncovered with the use of symbols as input to the interleaver; therefore, only the bit (hard decision) test was run.

The results of this test can be found on page A-4. As with the block interleaver, two separate BER counters were used to verify the operation of the interleaver. The 0 Bit Error Rates measured at both locations indicate that the synchronous interleaver is performing as expected.

4.6 SOFT DECISION VITERBI DECODING (TEST 7)

This set of tests is intended to verify that the FH, PN-FH, DPSK and 8-FSK modems in FSCSS are now capable of passing soft-decision metrics to the Viterbi algorithm decoders.

Figure 4-9 shows the general test configuration used for this set of tests. The 8-FSK configuration is different in that: (1) a bit-to-symbol converter precedes the modulator to demonstrate symbol inputs to the modulator; and (2) a symbol-to-bit converter is used after the demodulator to convert the demodulator output symbol voltages to soft bits for use by the Viterbi algorithm decoder.

Test sheets and results are presented in pages A-5 through A-8. A summary of the test results is contained in Table 4-1 and FFT plots of the signal spectra are shown in Figures 4-10 through 4-13.

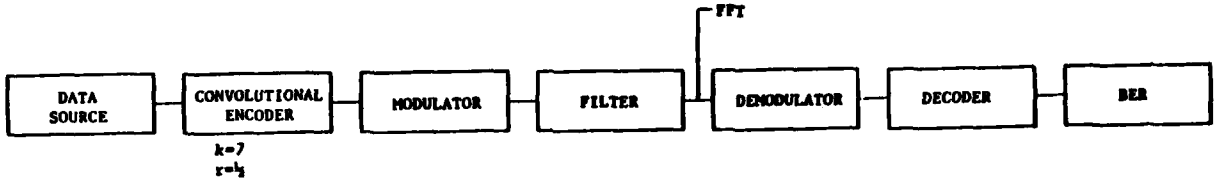
The Viterbi algorithm decoder was tested thoroughly during the Phase II acceptance tests. The intent of this set of tests is to demonstrate that the demodulators in question were correctly modified to pass soft bits (i.e., demodulator output voltages) to the Viterbi algorithm decoder. If this information is not passed correctly, decoding errors would be expected, even in the absence of thermal noise. The fact that no bit errors were detected indicates that the demodulators and symbol-to-bit converter are operating correctly.

4.7 MSK SOFT DECISION DECODING (TEST 8)

This test is intended to demonstrate two capabilities: soft-decision decoding for MSK demodulators, and the storage and reuse of time samples.

The test setup is shown in Figure 4-14. The DPSK, PN-FH and FH modulators used in the preceding set of tests were configured into a transmit earth terminal. The resulting composite signal was then transmitted to a satellite which contained a "Keep Samples" device. The resulting stored samples were then reused ("regenerated") in conjunction with an MSK signal.

The results of these tests are shown on page A-9. Figures 4-15 and 4-16 show the FFTs taken minus and with the MSK waveform. In order to simplify our testing, a "notch" was created



V.A. DECODER

8 LEVEL (3 BIT) QUANTIZATION

$\sigma^2 = 0.5$, VOLTAGE MEASUREMENT

QUANTIZER
METRICS: 0 1 2 3 4 5 6 7
7 6 5 4 3 2 1 0

Figure 4-9. Block Diagram for Soft Decision Decoding Tests

Table 4-1. Results of Soft Decision Decoding Tests

MODULATION SCHEME	DATA RATE (kbps)	BER EXPECTED	BER OBSERVED
PN-FH	250	0	0
FH	250	0	0
DPSK	250	0	0
8-PSK	250	0	0
8-FSK	2.4	0	0

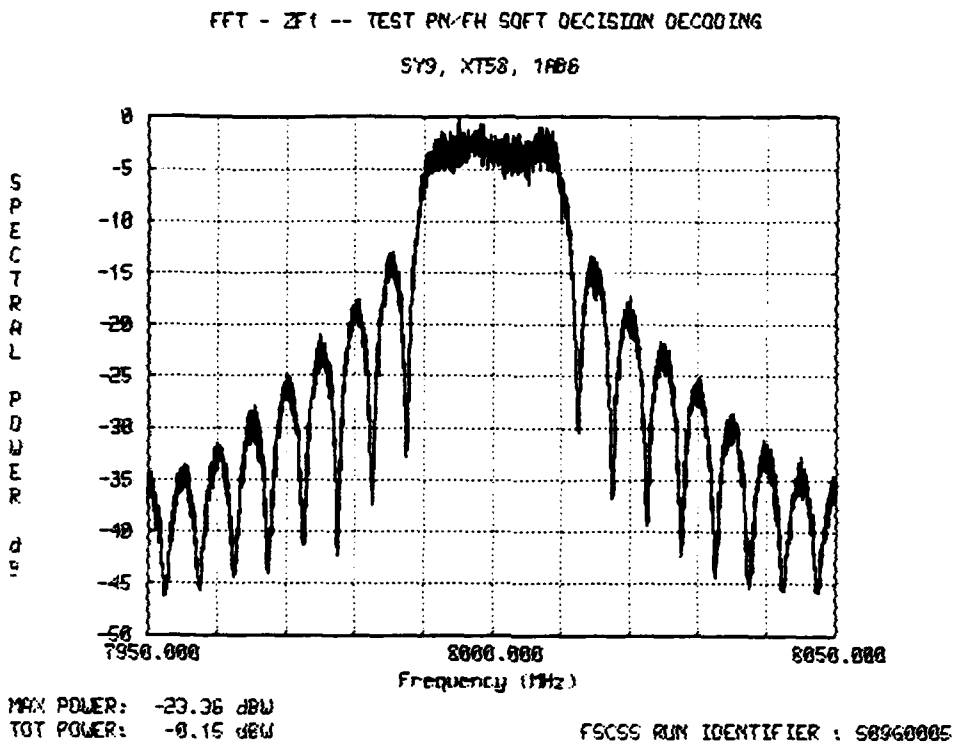


Figure 4-10. Soft Decision Test PN-FH Spectrum

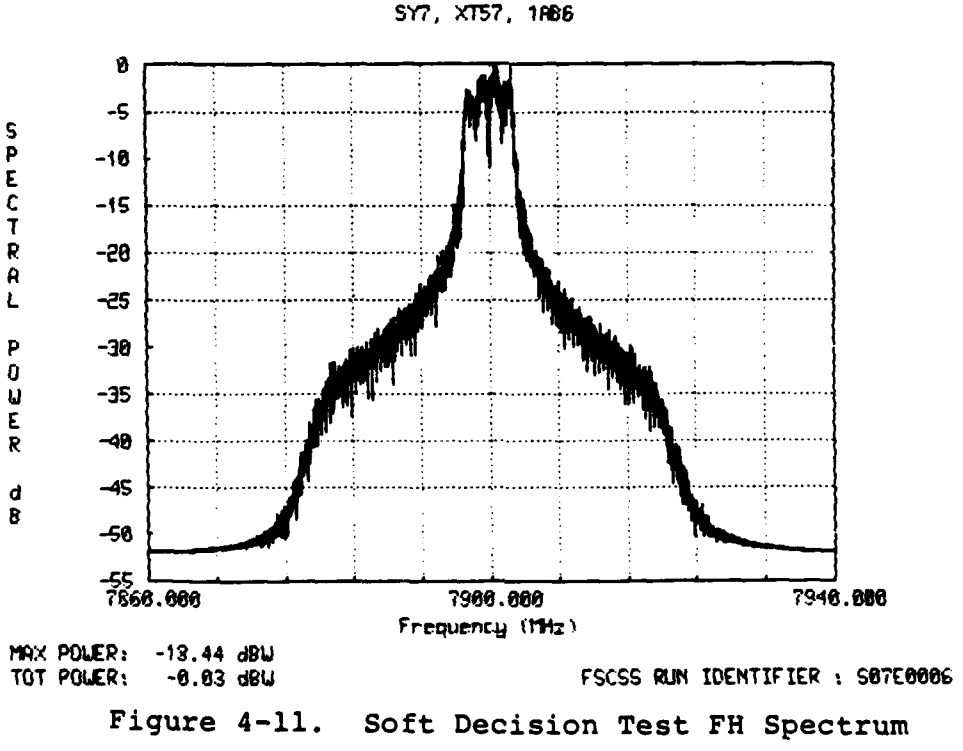


Figure 4-11. Soft Decision Test FH Spectrum

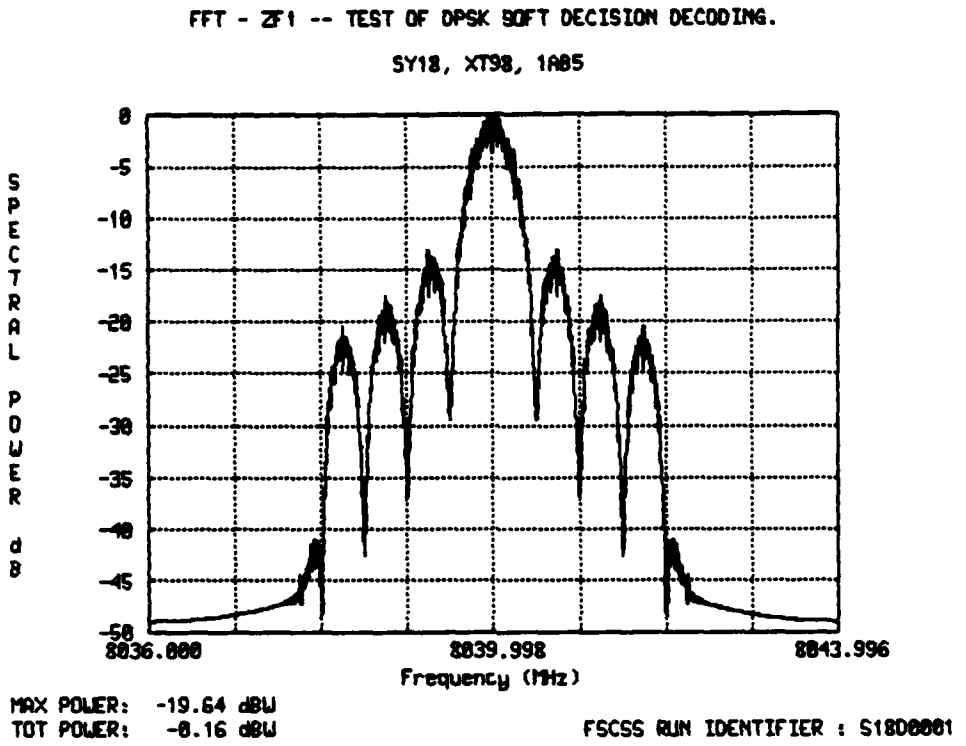


Figure 4-12. Soft Decision Test DPSK Spectrum

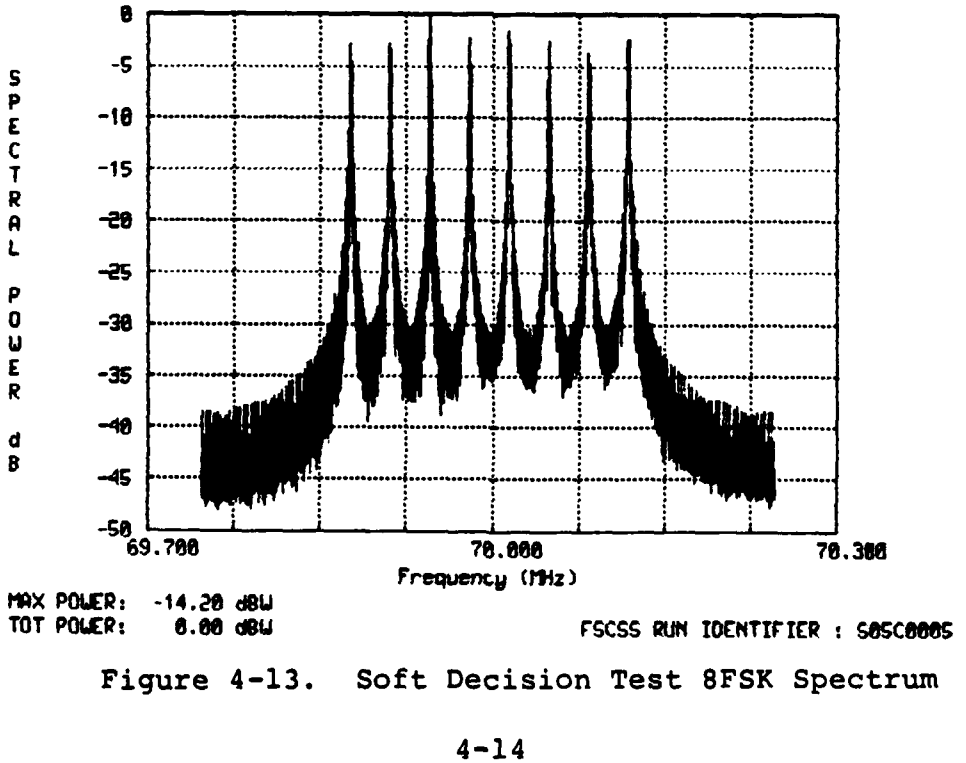


Figure 4-13. Soft Decision Test 8FSK Spectrum

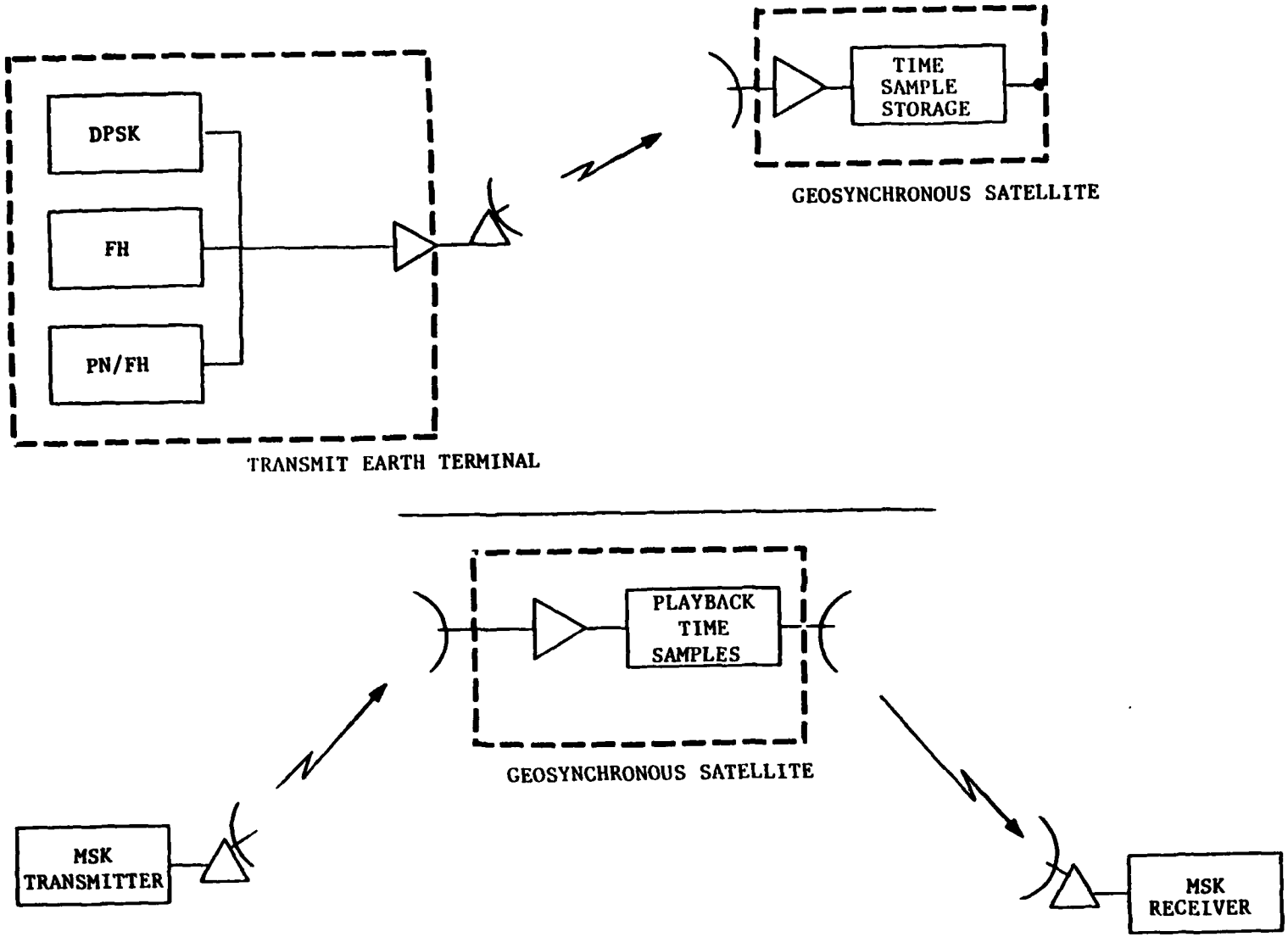


Figure 4-14. MSK Soft Decision Decoding Configuration

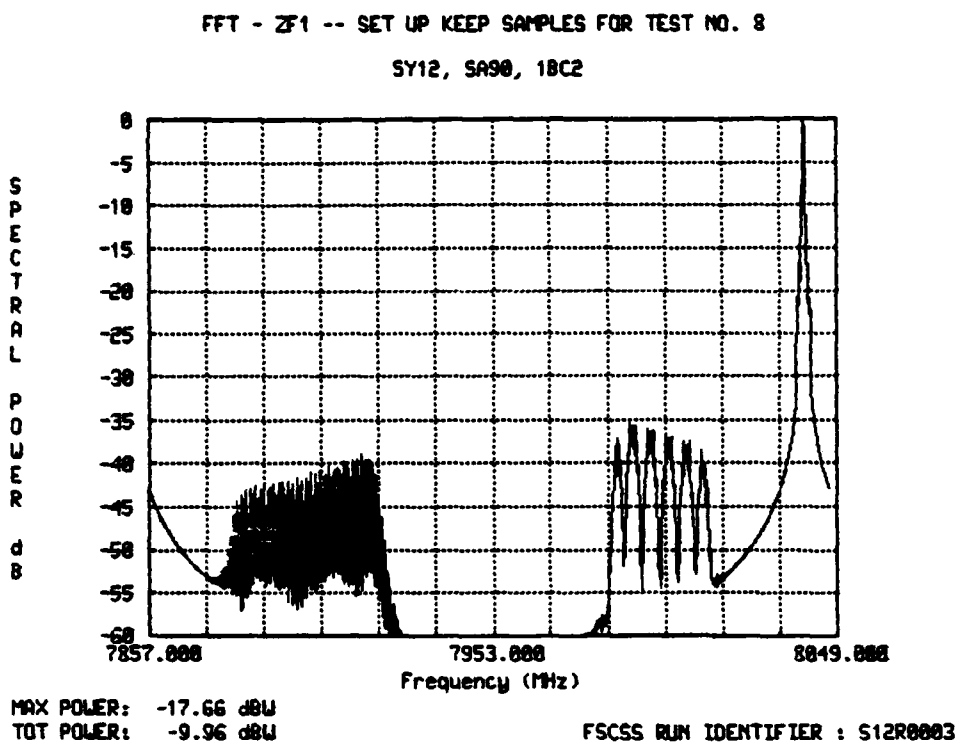


Figure 4-15. Stored Spectrum

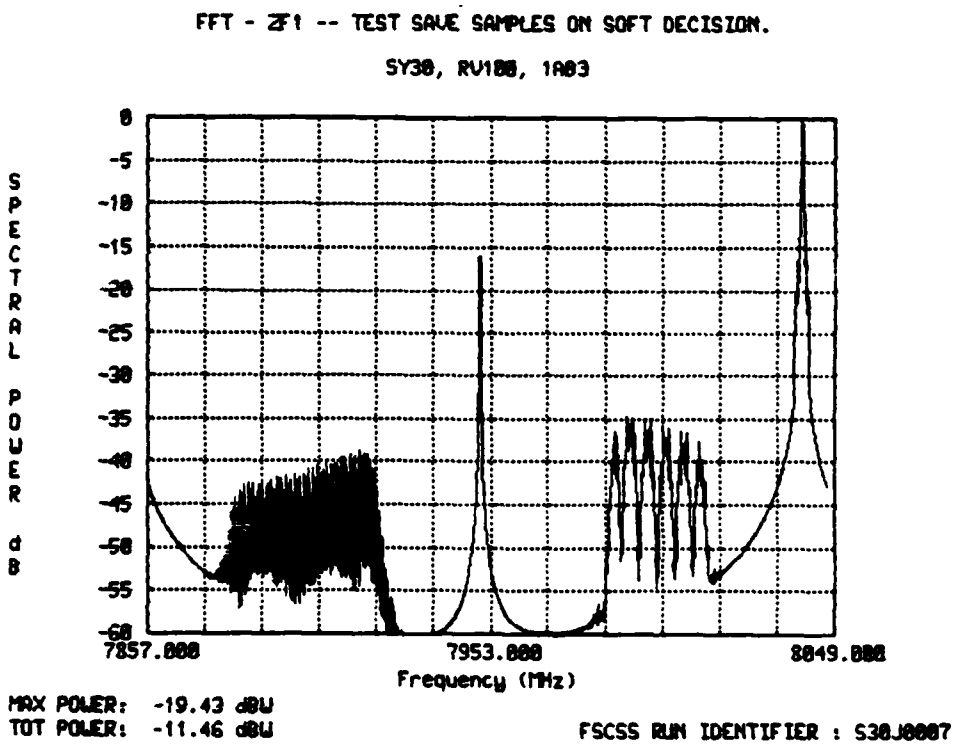


Figure 4-16. Composite Spectrum

in the spectrum to be stored by making the transmit filters have a very sharp cutoff. Due to the absence of thermal noise or adjacent channel interference in this notch, the demodulated MSK signal had a 0 BER, as expected.

4.8 OSCILLATOR PHASE NOISE (TEST 9)

The purpose of this test is to verify the operation of the FSCSS oscillator phase noise model. This model has been revised to allow for a more realistic number of points (50) to specify the spectral characteristics of the oscillator phase noise. A capability has also been added that allows the user to specify coefficients of the phase characteristic and to have FSCSS calculate the 50 sample points.

Phase and thermal noise degradations are measured indirectly by using the demodulator statistics measurements in FSCSS. The effect of the thermal noise which passes through the loop filter and subsequently perturbs the local oscillator is measured at the output of the local oscillator. It is given by the variance of oscillator phase. The degradation due to the oscillator phase noise which is not cancelled out by the loop filter is measured at the phase lock loop (PLL) and is given by the variance of PLL error. A PLL model showing the measurement points is given in Figure 4-17.

The procedure followed was to measure each degradation separately in the absence of the other and then compare the results with those given in Reference 12. The results of these tests are shown on page A-10. There was very good agreement in the thermal noise portion of the runs--within 0.4 dB of the value given in Reference 12. The phase portion of the results, however, was about 4 dB low according to the reference. A study was undertaken to determine the cause of the discrepancy. The PLL bandwidth was varied $\pm$ 2 Hz from the optimum of 10.89 Hz and the thermal and phase noise tests repeated. The results of this

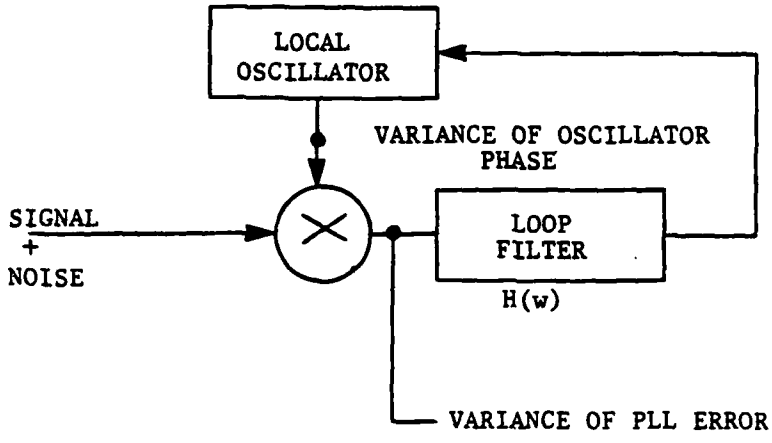


Figure 4-17. PLL Model and Measurement Points

investigation are given in Table 4-2. A set of calculations of the expected thermal and phase noise variance for an ideal ("square" transfer function) loop filter were made and are also given in Table 4-2. Both calculated and measured results are given graphically in Figure 4-18.

As can be seen, the thermal noise measurements are consistently about 0.8 dB above the calculated values. This is due to the fact that the loop filter is not ideal. The noise equivalent bandwidth seems to be about 1.1 times the nominal bandwidth which is consistent with Figure 3-2 of Reference 12. Thus, the thermal noise portion of the results tends to confirm the results of Phase II Acceptance Tests (Reference 6) - the FSCSS phase lock loop implementation is working correctly.

The phase noise results of Figure 4-18 tell a lot about the nature of the problem. Firstly, the slope of the calculated and measured curves are the same, indicating that the spectral shape of the phase noise is correct. Since the spectrum of the phase increases sharply with falling frequency, one expects considerably more power through the real PLL filter than through an ideal square filter. From the filter shape given in 3-2 of Reference 12, one would expect roughly 6 dB more power through the real filter than through a square filter. The measurement indicates only 3 dB more. The results of this acceptance test and of these further exploratory tests are therefore consistent. The FSCSS phase noise process is correct except for a -3 dB constant multiplier.

An examination of the FSCSS FREQTR module, which implements the phase noise generation, revealed that an error was introduced in the code during the process of removing extraneous diagnostic code used to find outstanding problems from Phase II. The input noise process had been made real rather than complex by setting the imaginary part to zero. This, of course, results in the 3 dB reduction in power.

Table 4-2. Phase Noise Results

1. MEASUREMENTS

LOOP BANDWIDTH (Hz)	VARIANCE OF OSCILLATOR PHASE (THERMAL NOISE) (dB)	VARIANCE OF PLL ERROR (PHASE NOISE) (dB)
8.89	-15.66	-19.56
10.89	-14.60	-21.17
12.89	-13.98	-22.43

2. CALCULATED RESULTS (Assuming ideal square cutoff in PLL filter)

LOOP BANDWIDTH (Hz)	THERMAL NOISE POWER (dB)	PHASE NOISE POWER (dB)
8.89	-16.60	-23.0
10.89	-15.70	-24.8
12.89	-15.00	-26.1

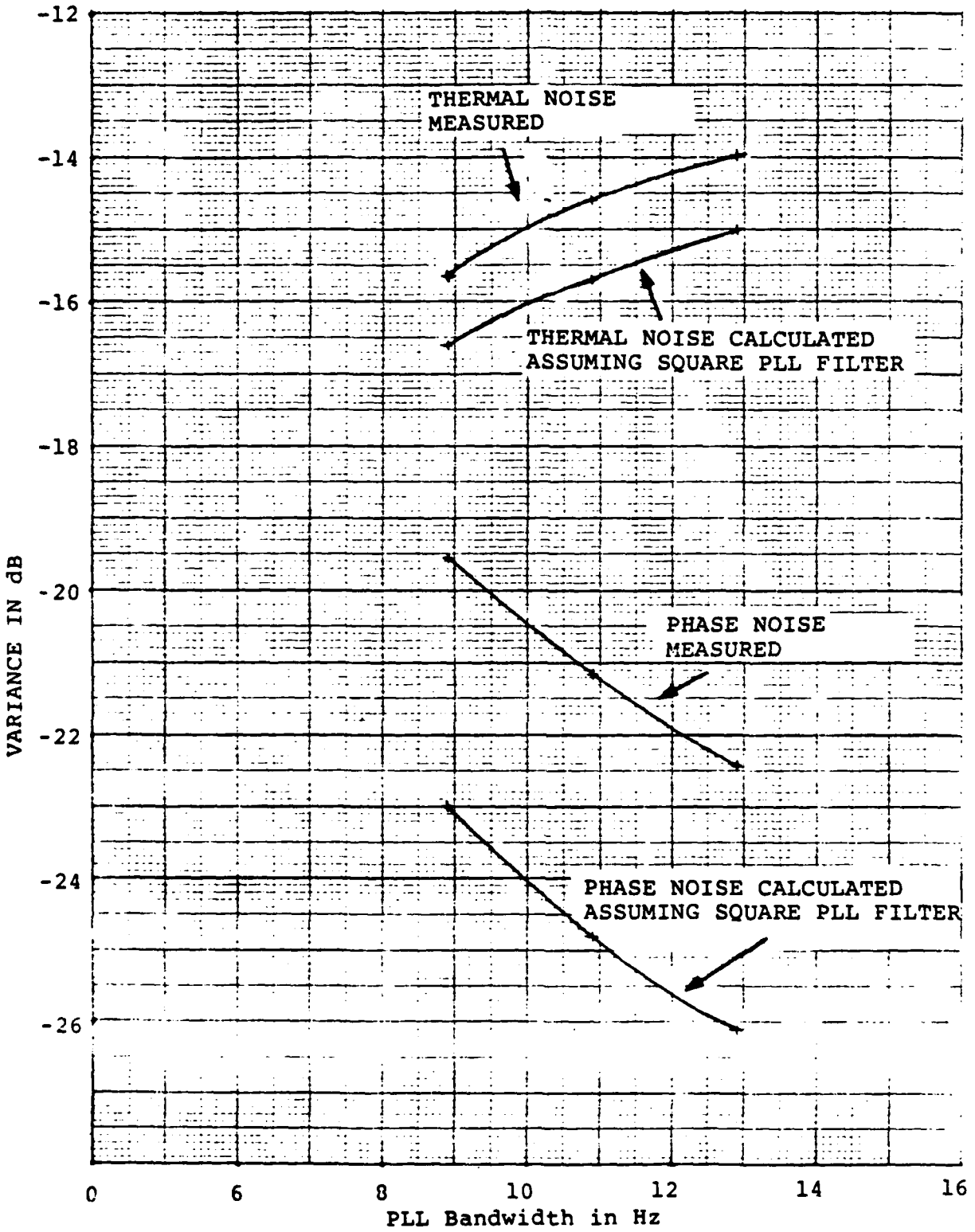


Figure 4-18. Phase Noise Test Results

This error was corrected and the expected 3 dB increase in phase noise was measured. The correct result of this test is then -18.1 dB (re 1 rad^2/Hz) measured versus -17.1 dB predicted by Reference 12. This seems to be an excellent agreement in light of the 2 Hz phase noise spectral line spacing used in the test.

4.9 REMODULATION (TEST 10)

The purpose of this test is to demonstrate the FSCSS capability to demodulate and subsequently remodulate a signal onboard a satellite. In this test a noiseless, linear channel was assumed since the essential point to be demonstrated is the correct passing of bits from the demodulator to the modulator for remodulation.

A QPSK signal was used on the uplink and a differentially encoded OQPSK was used on the downlink. The only losses were due to free space. As expected, neither link had any bit errors. The accompanying CSER plots (Figures 4-19 and 4-20), as well as a detailed analysis of the demodulator reports, indicate that FSCSS is handling remodulation correctly. The results of these tests are shown on page A-11.

4.10 ATMOSPHERIC EFFECTS (TEST 11)

These tests are intended to demonstrate that the modifications to the atmospheric effects device operate correctly on uplink and downlink paths. FSCSS was operated in the interactive mode with debugging data switches turned on so that the atmospheric effects calculations performed during the presimulation phase could be observed and captured on the Tektronix hard copy terminal, shown in Figure 4-21. Atmospheric absorption, cloud attenuation, and rain attenuation values obtained from Figure 4-21 were compared to hand calculations shown in the test results on pages A-12 and A-13.

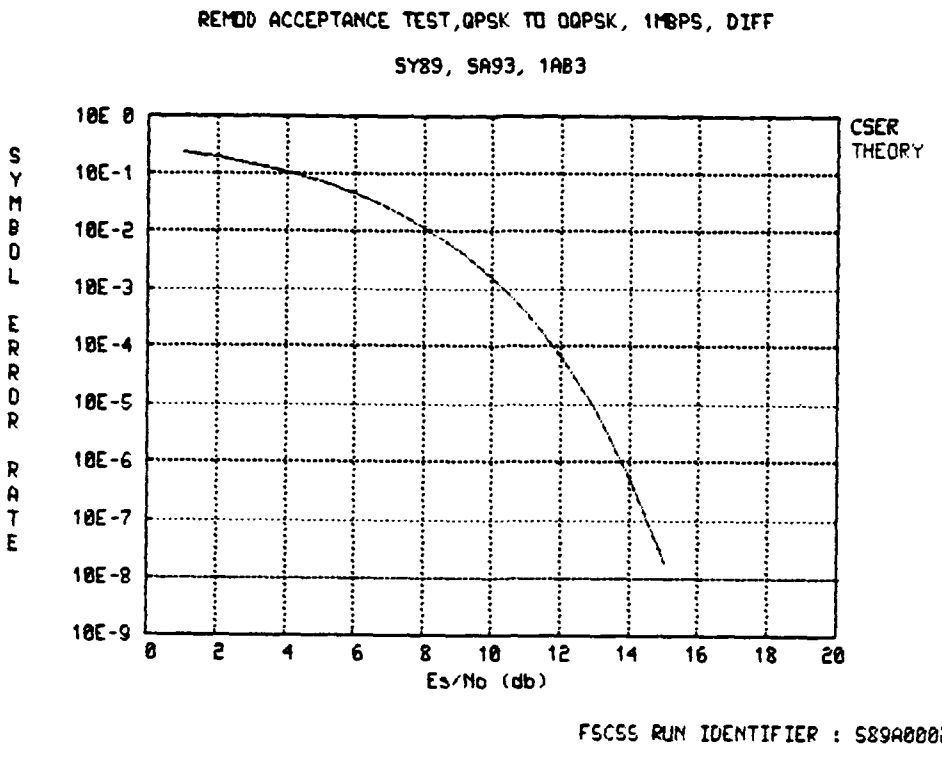


Figure 4-19. CSER Measurement: Satellite Demodulator

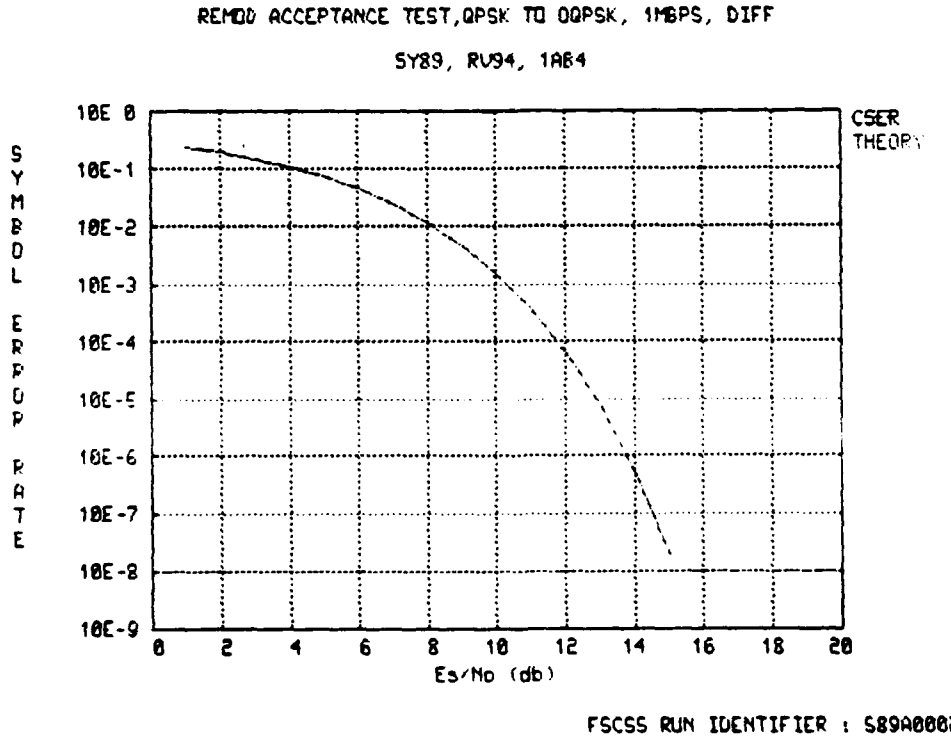


Figure 4-20. CSER Measurement:
Receive Earth Terminal Demodulator

```
            $$$ Enter TRLOSS
Reading in Transmitting Element record number:       236
Reading in Receiving Element record number:          152
$$$ ENTERING FREESP...
 AZIMUTH ANGLE FROM TRANS-->RECEIVER: 4.35703E+00
 AZIMUTH ANGLE FORM REC-->TRANS :  8.01187E-01
ELRCXM = -1.42381E+00
ELXMRC =  2.46081E-01
DFTRAN =  1.46981E-01
FRSPLS =  5.93436E-11
$$$LEAVING FREESP...
Just back from FREESP
AZXMRC =  4.35703E+00
ELXMRC =  2.46081E-01
ELRCXM = -1.42381E+00

Inside scan loop, PLPTRTMP =          12
DIRECTN =          -1
AZPATH =  4.35703E+00
ELPATH =  2.46081E-01
ANTLNG =  2.09440E+00
.... Enter BOUNDCHECK
PLPTRTMP =          11
PLDEVNAM = AN
PLDEVNAM = AN
ANINDEX =           1
Inside scan loop, PLPTRTMP =          12
AZPATH =  8.01187E-01  ELPATH = -1.42381E+00
.... Enter BOUNDCHECK
PLPTRTMP =          13
PLDEVNAM = WE
PLDEVNAM = WE
$$$ BEGIN PROCEDURE PROP
ATMOS ABSORPTION FLAG=YE
FCENT= 1.80000000000000E+10  X= 4  TOTZNAT = 2.70000E-02
ATMOS ASSORP= 1.10835E-01  AEATTEN= 9.87321E-01
CLOUD ATTENUATION FLAG=YE
CLOUD ATTEN (ATCLD) = 2.39079E+01  AEATTEN = 6.29596E-02
RAIN ATTENUATION FLAG=YE
AEDIVER FLAG= NO   TIMSIG= 9.99900E-01
RAIN RATE (RAINRT) =  3.70000E+01
RAIN ATTENUATION (ATRAIN)= 3.67677E+01    AEATTEN= 9.13433E-04
CROSS POLARIZATION FLAG=YE
CROSS POLARIZATION (AXPOL)= 1.46020E+00    AEATTEN= 7.72089E-04
--- END OF PROP WITH STATUS =           1
.... Enter BOUNDCHECK
PLPTRTMP =          14
PLDEVNAM = AN
PLDEVNAM = AN
ANINDEX =           1
     $$$ Leave TRLOSS
            $$$ Enter TRLOSS
Reading in Transmitting Element record number:       152
Reading in Receiving Element record number:          150
$$$ ENTERING FREESP...
 AZIMUTH ANGLE FROM TRANS-->RECEIVER: 7.86012E-01
```

Figure 4-21. Atmospheric Effects Debug Data

Several minor problems were discovered during the test; namely:

1. Atmospheric absorption - interpolation for water vapor densities between 0 and 7.5 gm/m^3 is not done correctly.
2. Downlink paths - the satellite's elevation angle is used for the calculations instead of the receive earth terminal's.
3. Cross-polarization - the rain model attenuation calculation includes the effects of signal depolarization, but the cross-polarization loss is being added separately.

These problems will be corrected during the maintenance phase of the contract.

4.11 NUCLEAR EFFECTS (TEST 12)

This set of tests is intended to verify that the FSCSS nuclear effects enhancement to the propagation anomalies device is working correctly.

The Channel Impulse Response Function (CIRF) (Reference 8), which is the heart of the nuclear effects device, has been tested off-line and verified to be working properly (Figure 4-22). This program was then integrated into the FSCSS environment for testing. The CIRF function has been implemented essentially directly from Reference 8. The original program generates 2048 samples, which, given the signal decorrelation time (τ_o), determines the time interval spanned by the sequence. For FSCSS runs longer than that time span, multiple calls to the CIRF routine are required. A modification was made to the CIRF routine to provide a smooth transition between 2048-sample sequences.

Two separate tests were run to demonstrate operation of the CIRF routine: a CW carrier test and a BPSK test. The results of these tests can be found on pages A-14 and A-15. In both cases, values were chosen for the nuclear effects device which seemed

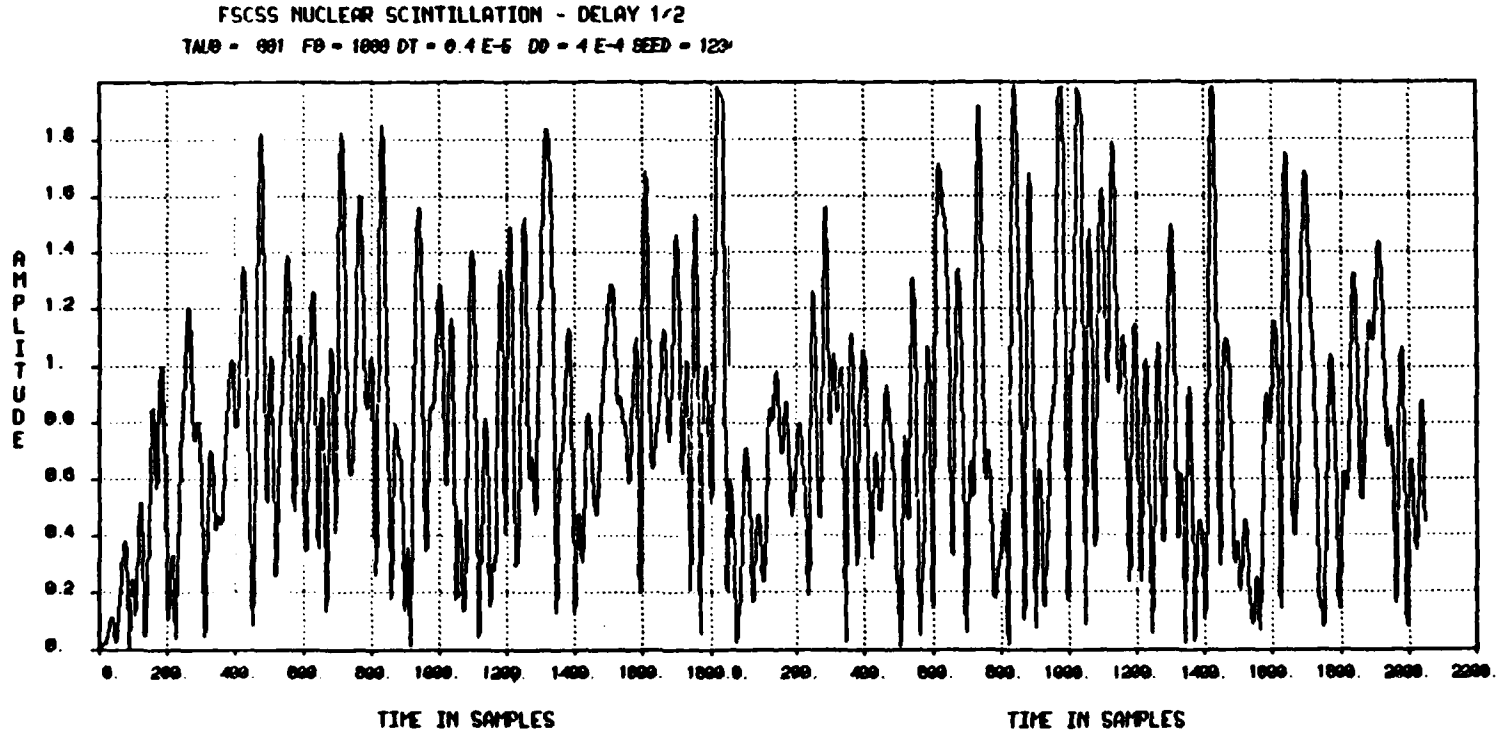


Figure 4-22. CIRF Amplitude Fading Plot

reasonable but which do not correspond to any particular scenario: low absorption, small decorrelation times, and large frequency selective bandwidths.

The results for the CW case are shown in Figures 4-23 and 4-24. Note that the signals have been "smeared", indicating that phase perturbations exist on the channel giving the appearance of a phase modulated waveform.

In the BPSK case we note that the inphase I&D voltage (Figure 4-25) now has a slowly (relative to the data rate) changing envelope. The quadrature I&D voltage (Figure 4-26), which we normally expect to be 0, also has a changing envelope, again indicating that there is a phase perturbation on the channel. Likewise, the carrier phase (Figure 4-27) is changing quite dramatically with time. Upon examining the detailed BER report on our listing, we find that the PLL is able to track the signal for some 193 bits, then loses lock and is unable to regain carrier lock on the signal.

The above results lead us to believe that the nuclear effects device is working correctly. Further tests will be conducted during the maintenance phase to obtain quantitative results.

4.12 MSK MODULATORS AND DEMODULATORS (TESTS 7 & 8 OF PHASE II)

The purpose of this set of tests is to verify the operation of the MSK modem in the presence of thermal noise. A test configuration was used which has a wide bandwidth and a completely linear channel. The demodulator was "locked" during the presimulation phase using a noiseless preamble.

The results of this test are given on page A-16. Table 4-3 summarizes the results obtained. The BER to be obtained was based upon results given in Reference 16. Very close agreement with the theoretical results was obtained.

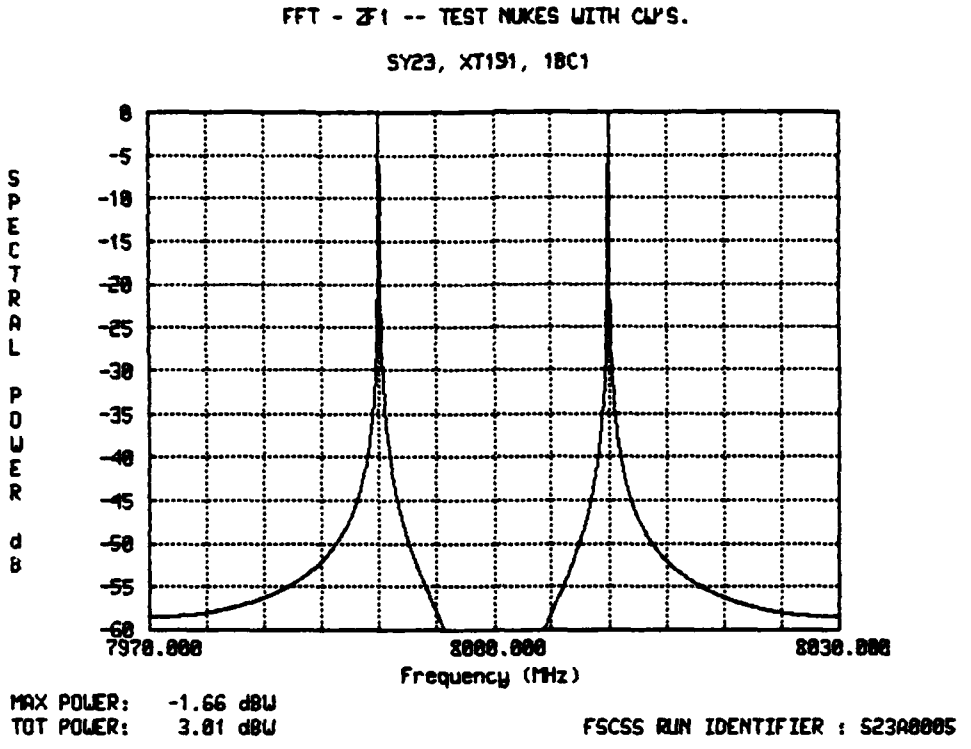


Figure 4-23. C. W. Test Spectrum before Nuclear Scintillation

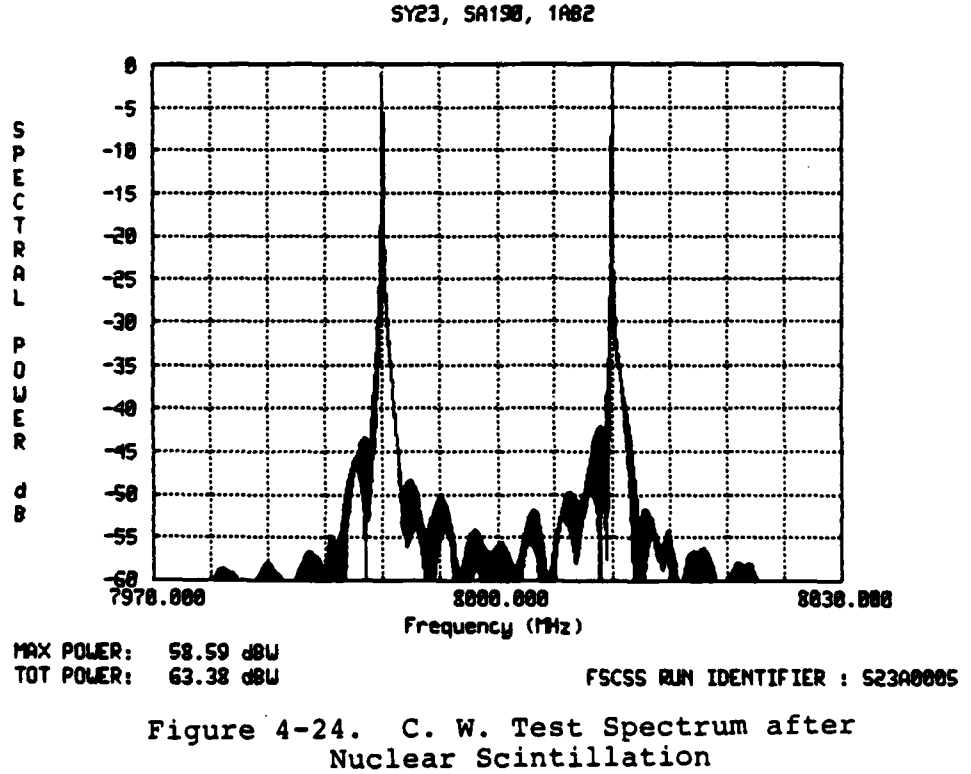


Figure 4-24. C. W. Test Spectrum after Nuclear Scintillation

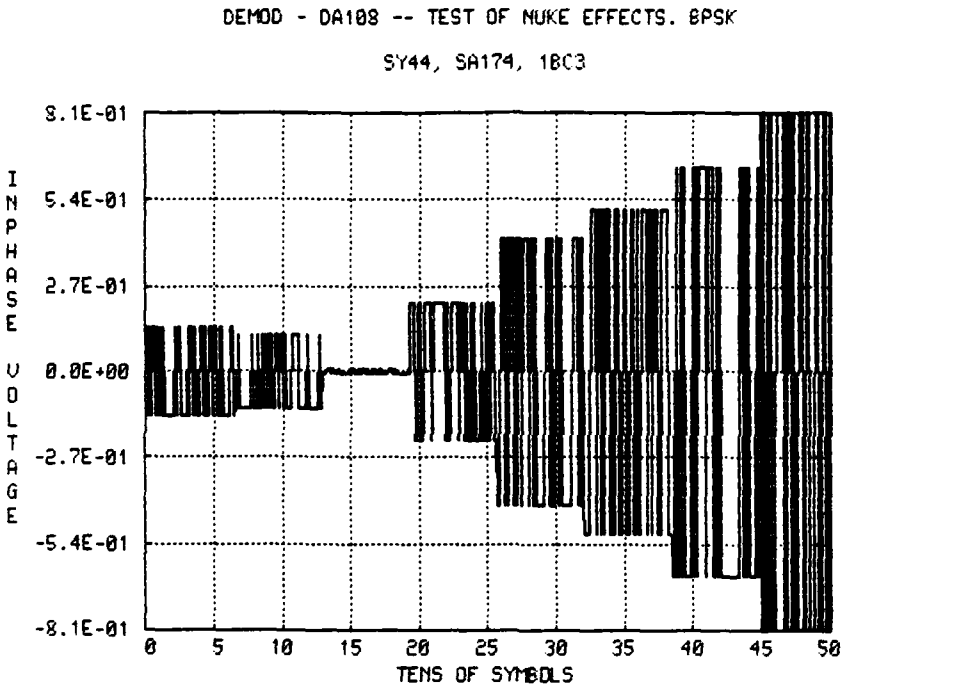


Figure 4-25(a). BPSK I&D Inphase Voltage

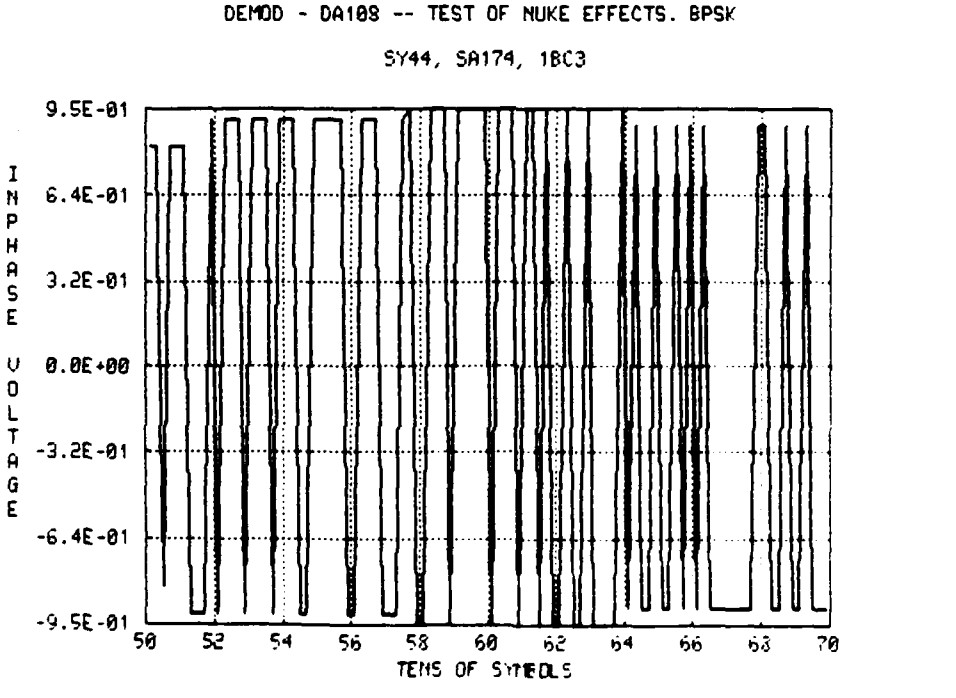


Figure 4-25(b). BPSK I&D Inphase Voltage

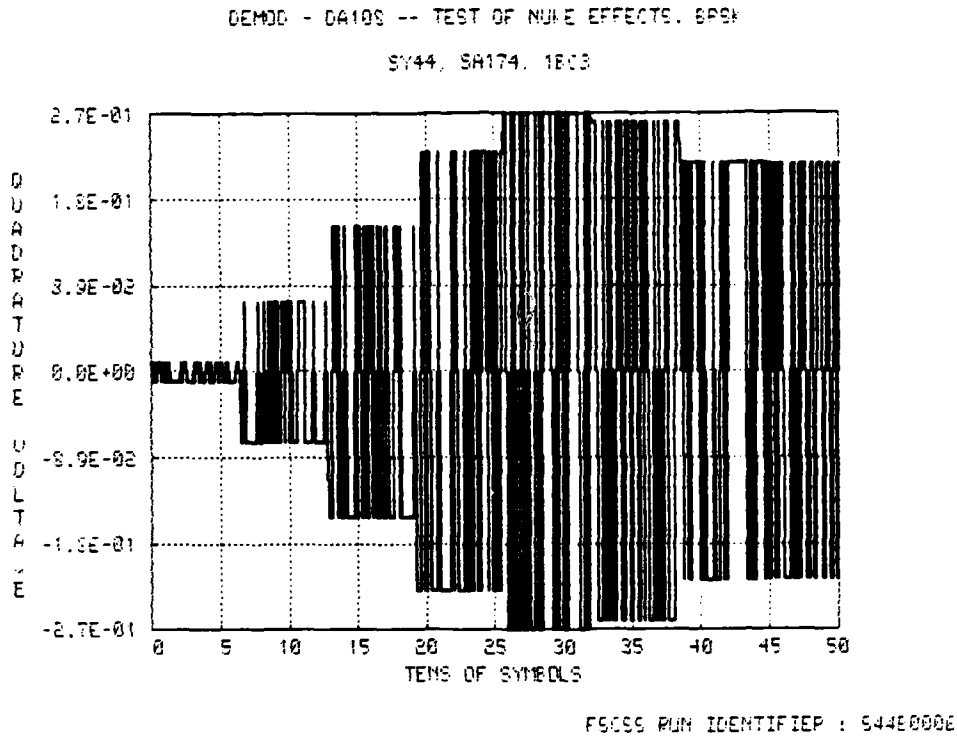


Figure 4-26(a). BPSK I&D Quadrature Voltage

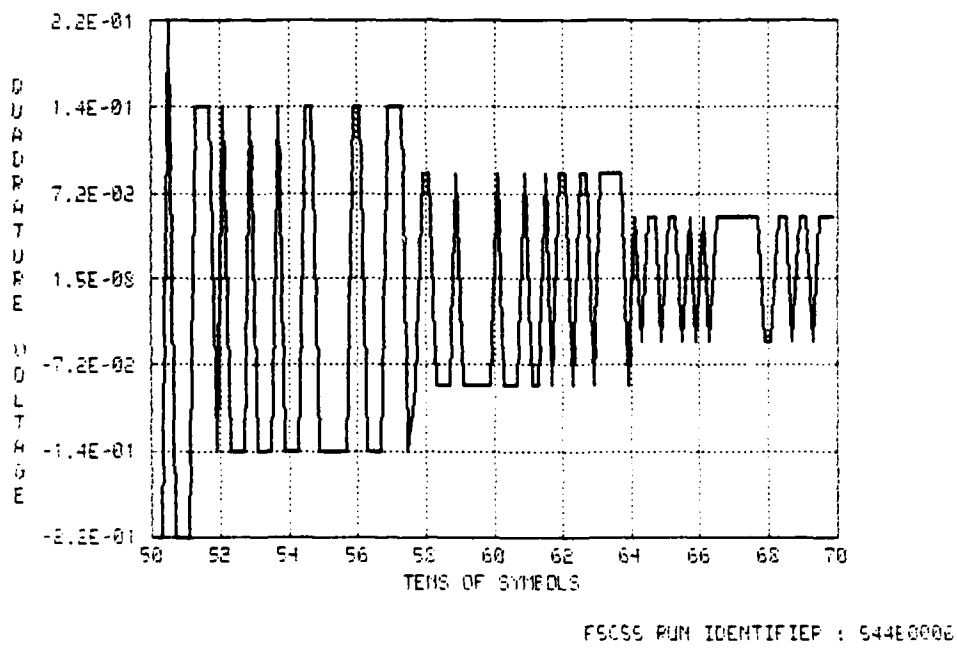


Figure 4-26(b). BPSK I&D Quadrature Voltage

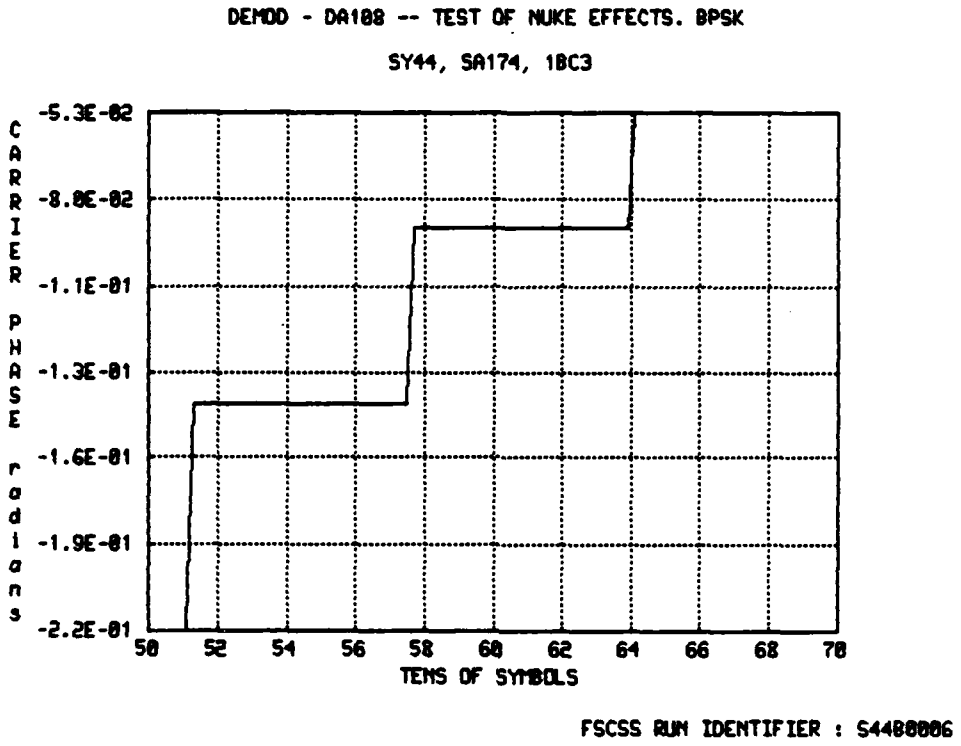


Figure 4-27. BPSK Carrier Phase Plot

Table 4-3. MSK Thermal Noise Results

TEST	E_b/N_o (dB)	EXPECTED BER	MEASURED BER	ACCURACY (%)	NUMBER OF BITS
7	3	3.2×10^{-2}	3.22×10^{-2}	+.63	11,876
8	5	1.0×10^{-2}	1.00×10^{-2}	$\pm$ 0	34,814

SECTION 5 - CONCLUSIONS

The enhancements added to FSCSS during Phase III represented a large effort over a compressed period of time. The result was that all the enhancements could not be tested to our total satisfaction before the formal acceptance test phase. All devices passed acceptance tests successfully except for the block and synchronous interleavers in configurations with other encoders, and minor errors in the atmospheric effects phase noise calculations. These problems will all be corrected during the FSCSS maintenance phase.

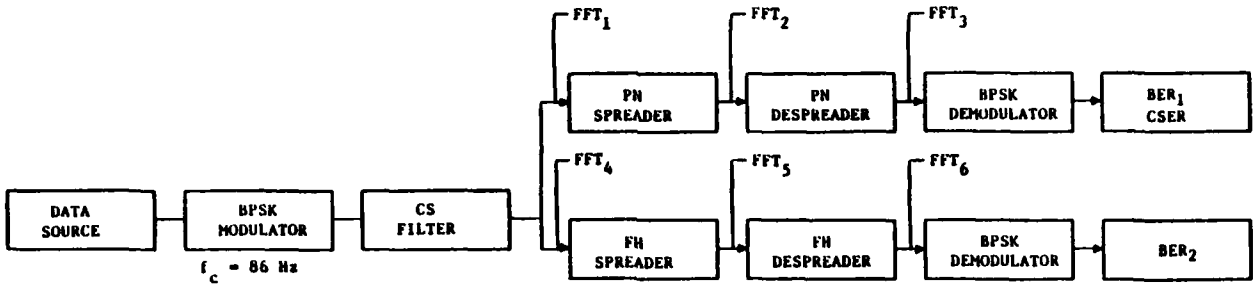
Version 3.0 of FSCSS has met the goals established during Phase III of the contract. Improved user-friendliness has been achieved, a color graphics system has been integrated, simulation speed has been improved, additional devices and capabilities have been added, and unresolved problems left over from Phase II have been solved. Updated versions of both the User's and Software Maintenance Manuals have been delivered. Table 5-1 summarizes the features modeled by FSCSS Version 3.0.

Table 5-1. SATCOM Features Modeled by FSCSS

Data Sources	Random, External Sequence
Encoders/Decoders	Differential Convolutional (Viterbi algorithm decoding), Block and Synchronous Interleavers/ Deinterleavers, Bit-to-Symbol and Symbol-to-Bit Converters
Modulators/Demodulators	BPSK, QPSK, OQPSK, 8PSK, 16PSK, DPSK, APSK, FSK, MSK, CPFSK, PN, FH(FSK), FH(PN)
Jammers/Interferers	CW, SWEPT, PULSE, Demand Access with Modulators Above
Filters	Chebychev, Butterworth, Thompson, Transitional Butterworth/Thompson, Bessel, Legendre, Poles and Residues, Frequency Sample (30 Amplitude and Phase Points), Poles and Zeros
Limiters	Hard, Soft (30 Amplitude and Phase Points)
Frequency Translators	Up, Down, Phase Noise (50 Frequency Samples on One Side of the Carrier)
Antennas	Earth Coverage, Narrowbeam, MBA (Bessel Singlets), MBA (Stored Singlets), Phased Array, Gain, Adaptive (MBA, Phased Array)
Propagation	Free Space Loss, Atmospheric Effects, Doppler, Scintillation, Cross-Polarization, Arbitrary Fluctuations, Transmission Loss, Nuclear Effects
Noise Sources	Thermal Noise, Time Samples Stored from Previous Run
Measurements	Power, Fast Fourier Transform, Bit Error Rate, Demodulator Related Statistics all with Time Window Capabilities
Multiple Access Techniques	FDMA, SSMA, TDMA, SSTDMA, PNTDMA
Spreaders	FH, PN
Despreaders/Correlators	FH, PN, PN/FH
Standard Device Groups	Stored Combinations of the Above to Form Specific Modems, Earth Terminals and Satellites.

APPENDIX A - ACCEPTANCE TEST DATA SHEETS

ACCEPTANCE TEST 2: PN and FH SPREADERS



RUN	Pb_1	Pb_2	BER_1	BER_2	P_1 (dB)	P_2 (dB)	P_3 (dB)	P_4 (dB)	P_5 (dB)	P_6 (dB)	NOTES
1	0	0	0	0	-0.55	-0.55	—	-0.55	-0.55	—	1K bits

DEVICE PARAMETERS:

DATA SOURCES: 1 Mbps

PN SPREADER: 40 MHz = R_c
86 Hz = f_c
I&Q Registers = 31 bits long
I Seed = 14656
Q Seed = 14854

FH SPREADER AND DESPREADER: 86 Hz = f_c
4 MHz = Spacing
2^3 = 8 cells
.1 MHz Hop Rate
Generator = 10 bits
Seed = 12345

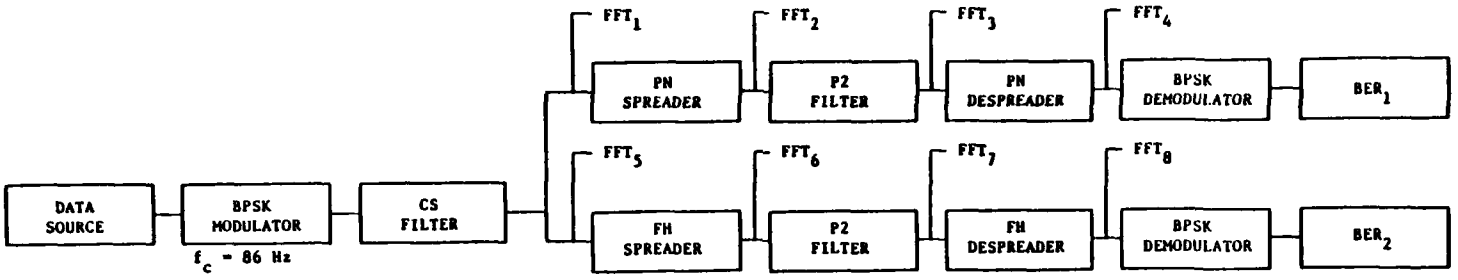
PN DESPREADER: 40 MHz = R_c
8 GHz = f_c
I&Q Registers = 31 bits long
I Seed = 14656
Q Seed = 14854
TLL Bandwidth = .1 Hz .707 = z
Filter = 10 MHz Wide

CS FILTER: 3 dB Bandwidth = 2 MHz
11 Poles
Ripple = .01 dB

BPSK DEMODULATOR: TLL Bandwidth = .1 Hz .707 = z
PLL Bandwidth = 1 Hz .707 = z
Hard Decision
I&D Detector
Min. Sig. = 0 dB
No Limiter

Performed by: [signature]
Witnessed by: [signature]
Date: 4 April 1985

ACCEPTANCE TEST 3: PN and FH SPREADER with POLES and ZEROS FILTER



RUN	Pb_1	Pb_2	BER_1	BER_2	P_1 (dB)	P_2 (dB)	P_3 (dB)	P_4 (dB)	P_2/P_3 (dB)	P_5 (dB)	P_6 (dB)	P_7 (dB)	P_8 (dB)	P_6/P_7 (dB)	NOTES
1	0	0	0	0	-	-0.64	-1.2	-	-.54	-	-0.69	-3.6	-	0	10 bits

DEVICE PARAMETERS:

DATA SOURCE: 1 Mbps

CS FILTER: 3 dB Bandwidth = 2 MHz
11 Poles
Ripple = 0.01 dB

PN SPREADER: 40 MHz = R_c
8 GHz = f_c
I&Q Registers = 31 bits
I Seed = 14656
Q Seed = 14854

FH SPREADER/DESPREADER: 8 GHz = f_c
4 MHz Spacing
8 Cells
1 MHz Hop Rate
Generator = 10 bits
Seed = 12345

PN DESPREADER: 40 MHz = R_c
8 GHz = f_c
I&Q Registers = 31 bits
I Seed = 14656
Q Seed = 14854
TLL Bandwidth = .1 Hz .707 = z
10 MHz Wide Filter

BPSK DEMODULATOR: 8 GHz = f_c
TLL Bandwidth = .1 Hz .707 = z
PLL Bandwidth = 1 Hz .707 = z
Hard Decision
I&D Detection
Min. Sig. = 0 dB
No Limiter

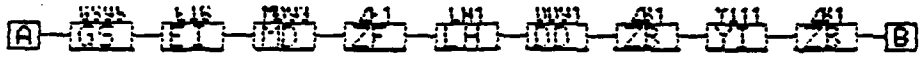
PZ Filter (Attached)

Performed by: [signature]

Witnessed by: JE Bickert

ACCEPTANCE TEST 4: SYNCHRONOUS INTERLEAVER WITH 8-FSK

Test Configuration: SY12, XT36



Data Rate: 2.4 Kbps

Interleaver Size: 13 x 29

Modulator Frequency: 150 MHz

Frequency Spacing: 50.1 KHz

RESULTS

Expected BER	Measured BER	No. of Bits
0	0	498

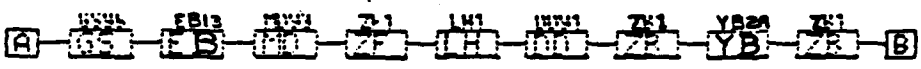
Performed by: D F Coward

Witnessed by: T E Bechert

Date: April 4, 1985

ACCEPTANCE TEST 5: BLOCK INTERLEAVER WITH 8-FSK, 2 REPETITIONS

Test Configuration: SY27, XT157



Data Rate: 2.4 Kbps

Interleaver Size: 8 x 32

Modulator Frequency: 70 MHz

Frequency Spacing: 35 KHz

RESULTS

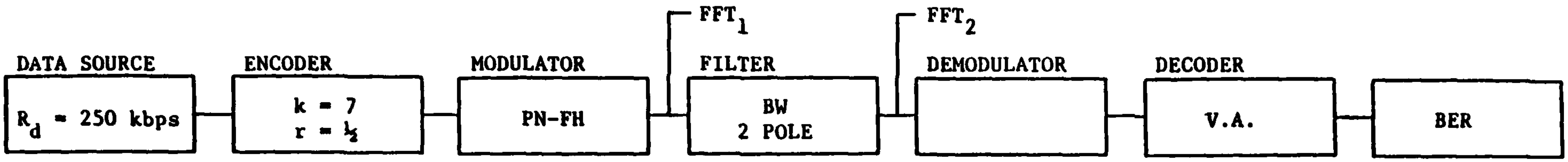
Expected BER	Measured BER	No. of Bits
0	0	1017

Performed by: M C Arnaud

Witnessed by: J E Beckert

Date: April 4, 1985

ACCEPTANCE TEST 7A: SOFT DECISION DECODING OF PN-FH



DEVICE PARAMETERS:

MODULATOR/DEMODULATOR

PN-FH

f_c = 86 Hz

Chip Rate = 5 MHz

Hopover 2^2 = 4 cells

= 5 MHz

I Register = 31 Bits Seed = 101010

Q Register = 31 Bits Seed = 101010

Hopping Register = 10 bits Seed =

TLL = Ø Hz z = .707

PLL = Ø Hz z = .707

Soft Decision

Min. Sig. Level = -10 dB

No AGC

FILTER

2 Pole Butterworth

3 dB = 25 MHz

ENCODER/DECODER

k = 7

r = ½

3 Bit Quantization

Memory Length = 40

σ^2 = .5

Quantizer Metrics:

RESULTS:

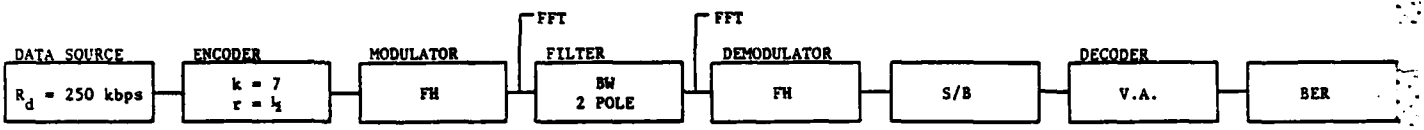
EXPECTED BER	MEASURED BER	P_1 (dB)	P_2 (dB)	P_1/P_2 (dB)	N. BITS
0	0	0	-0.2	+0.2	47

Performed by: [signature]

Witnessed by: [signature]

Date: April 4 1985

ACCEPTANCE TEST 7B: SOFT DECISION DECODING OF FREQUENCY HOPPER



DEVICE PARAMETERS:

MODULATOR/DEMODULATOR

f_c = 7900 MHz
Hopover 2^2 = 4 cells
cell = 1 MHz wide
2 FSK
Δf = 500 kHz
Hopping Register = 20 bits
Seed = 10101
TLL = 0 Hz z = .707
Soft Decision
Symbol Output

FILTER

Butterworth
Pole
f_c = 7900 MHz
3 dB =

CODER/DECODER

k = 7
r = ½
40 bit Memory
3 bit Soft Decision
σ^2 = 0.5
Quantizer Metrics

RESULTS:

EXPECTED BER	MEASURED BER	P_1 (dB)	P_2 (dB)	P_1/P_2 (dB)
0	0	0	-.03	.03

Performed by: [signature]
Witnessed by: J E Beckert
Date: April 4 1985

ACCEPTANCE TEST 7C: DPSK SOFT DECISION DECODING

DEVICE PARAMETERS:

MODULATOR/DEMODULATOR
- f_c = 8040 MHz
- TLL = ∅ Hz z = .707
- No AGC
- Min. Signal Level =
- Soft Decision

FILTER
- 11 Pole CS
- -1 dB Ripple
- 3 dB = 4 MHz

ENCODER/DECODER
- k = 7
- r = ½
- Memory = 40 bits
- 3 bit Soft Quantization
- σ^2 = .5
- Quantizer Metrics

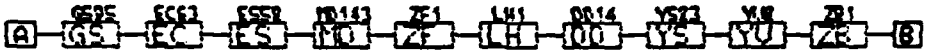
RESULTS:

EXPECTED BER	MEASURED BER	P_1 (dB)	P_2 (dB)	P_1/P_2 (dB)
0	0	0	[illegible]	[illegible]

Performed by: [signature]
Witnessed by: [signature]
Date: [illegible]

ACCEPTANCE TEST 7D: SOFT DECISION DECODING OF 8-FSK WITH SYMBOL INPUT TO THE MODULATOR

Test Configuration: SY5, XT25



Data Rate: 2.4 Kbps

Modulator Frequency: 70 MHz

Frequency Spacing: 35 KHz

Viterbi Decoder: Rate ½, Constraint Length 7, 3-Bit Quantization

RESULTS

Expected BER	Measured BER	No. of Bits
0	0	396

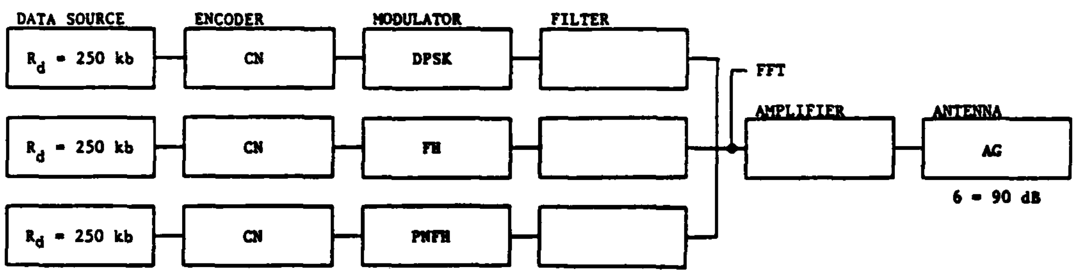
Performed by: D F Arnaud

Witnessed by: J E Bechert

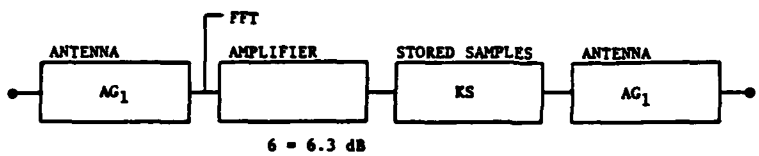
Date: April 4, 1985

ACCEPTANCE TEST 8: STORED AND PLAYBACK SAMPLES

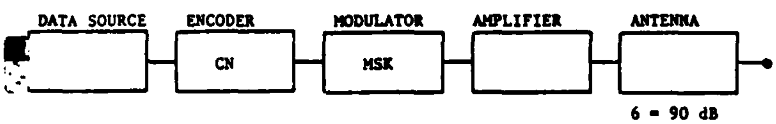
TRANSMITTER (1) STORED SAMPLES



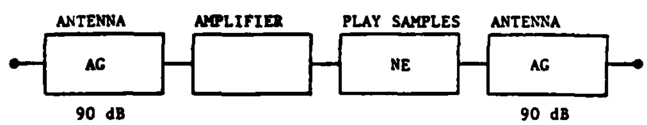
SATELLITE (1) STORED SAMPLES



TRANSMITTER (2) MSK



SATELLITE (2)

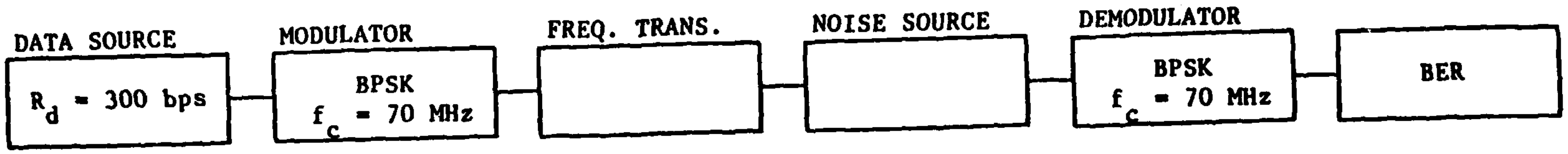


RECEIVER (2) MSK

EXPECTED BER	MEASURED BER	
0	0	1024 bits

Performed by: [illegible]
Witnessed by: [illegible]
Date: June 4 1985

ACCEPTANCE TEST 9: OSCILLATOR PHASE NOISE



DEMODULATOR PARAMETERS:

TLL = 0.1 Hz Decision Feedback, z = .707

PLL = 10.89 Hz Decision Feedback, 2nd order, z = .707

No Limiter at 0. dBW

Signal Level = 0 dB

I&D Detection

OSCILLATOR SPECTRAL CHARACTERISTICS:

H_0 = 1.26 E-10 Rad/Hz H_2 = 0.01 Rad·Hz

H_1 = 0 Rad H_3 = .2 Rad·Hz

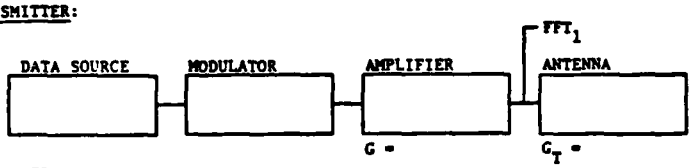
RESULTS:

RUN	Eb/No (dB)	TO	N. BITS	EXPECTED VARIABLE	MEASURED VARIABLE
1	-	0		-17.2	-21.17dB
2	1.3	1.79×10^{70}		-15.1	-14.61dB

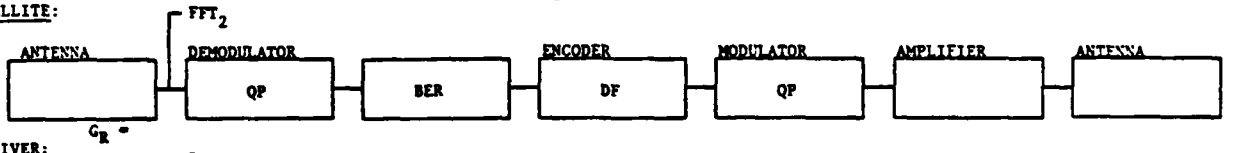
Performed by: [illegible]
Witnessed by: [illegible]
Date: 4 Apr 1985

ACCEPTANCE TEST 10: DEMODULATOR

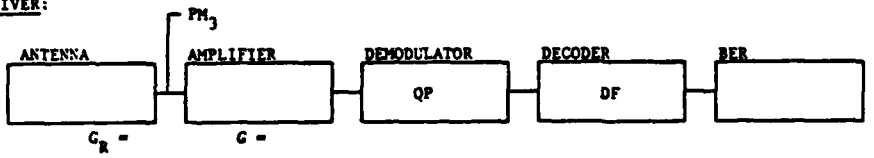
TRANSMITTER:



SATELLITE:



RECEIVER:



DEVICE PARAMETERS:

Data Rate =

MODULATOR/DEMODULATOR UPLINK

f_c = 8 GHz
QPSK
TLL = z = .707
PLL = z = .707
I&D Detection
Hard Decision
Min. Signal = 0 dB

MODULATOR/DEMODULATOR DOWNLINK

f_c = 8 GHz
QPSK
TLL =
PLL =
I&D Detection
Hard Decision
Min. Signal = 0 dB

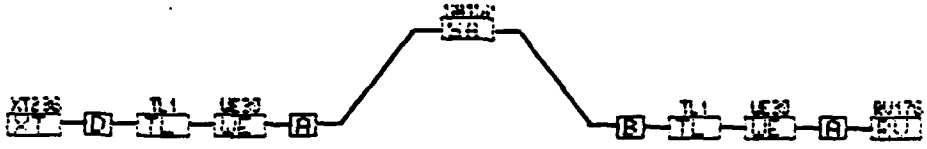
RESULTS:

EXPECTED BER	MEASURED BER	P_1 (dB)	P_2 (dB)	P_3 (dB)	
0	0	—	[illegible]	[illegible]	1024 bits
0	0				1000 bits

Performed by: [signature]
Witnessed by: [signature]
Date: [illegible]

ACCEPTANCE TEST 11: ATMOSPHERIC EFFECTS

Test Configuration: SY53, XT236, SA152, RV176



Simulation Frequency: 10 GHz

Atmospheric Absorption Water Vapor Density: 0 gm/m^3

Cloud Attenuation Water Vapor Density:

Cloud Thickness:

Cloud Temperature:

Rainfall Zone: D_1

Time Availability: 0.9999

0° Isotherm Height: 4 km

Cross-Polarization: Linear Horizontal Tilt Angle: 30°

RESULTS

Atmospheric Effect	Expected	Measured
Atmospheric Absorption:	0.21	.11
Cloud Attenuation:	23.91	23.11
Rain Attenuation:	36.76	36.76
Cross-Polarization Loss:	—	

Performed by: D F Arnaud

Witnessed by: J E Beckert

Date: April 4, 1985

ATTENUATION CALCULATIONS (EQUATIONS IN REFERENCE 7)

Cloud Attenuation:

A_c (dB) = $5 \times 10^{-25} \times M \times L \times F^2 \exp(0.0281(291-T))\csc \beta$

$M = 15 g/m^3$

$L = 10{,}000 m$

$F = 10$ GHz $= 10^{10}$ Hz

$T = 300$ K

$\beta = 14.099°$

A_c(dB) = 23.91

Atmospheric Absorption

Total Zenith Attenuation (From Table 1) = 0.051

$\beta = 14.099°$

A_a(dB) = TZA csc β

= 0.21

Rain Attenuation

$R_p = 37$ mm/hr (Zone D_1, Availability = 0.9999, Table 2)

Elevation Angle = 14.099°

D = 15.925

a = 0.0125 (From Table 3)

b = 1.18 (From Table 3)

$a R_p^b = 0.89$

c = -0.082

d = 1.633

$\nu = 4.249$

u = 0.803

$A_{sp} = 35.660$

$A_R = 36.768$

ACCEPTANCE TEST 12A: NUCLEAR EFFECTS WITH CW JAMMERS

DEVICE PARAMETERS

MODULATORS

CW_1 at f_c = 7990 MHz

CW_2 at f_c = 8010 MHz

ANTENNAS

90 dB Antenna Gain

FILTER

11 Pole CS

3 dB = 30 MHz

F_c = 8000 MHz

0.01 dB Ripple

AMPLIFIER

Gain = 25 dB

Propagation Anomalies Device

(Attached)

Performed by: [signature]

Witnessed by: [signature]

Date: [signature]

ACCEPTANCE TEST 12C: NUCLEAR EFFECTS ON BPSK

DEVICE PARAMETERS

Data Source = 10 Kbps

BPSK MODULATOR/DEMODULATOR

F_c = 8000 MHz

TLL = 0 Hz, DF, z = 0.707

PLL = 0 Hz, DF, z = 0.707 2nd Order

No AGC

No Limiter

Min. Sig. Level = 0 dB

Hard Decision

AMPLIFIER

G = 200 dB

ANTENNAS (Antenna Gain)

TX Uplink Gain = 20 dB

RX Uplink Gain = 20 dB

PROPAGATION ANOMALIES DEVICE

(Attached)

RESULTS

OBSERVED BER

NO. BITS

2048 1=100 500-1000

Received Signal Power =

Received Noise Power =

SNR =

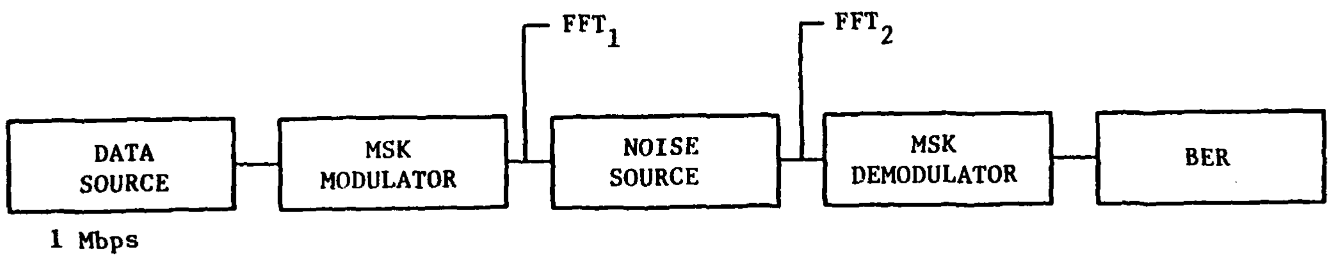
BER Estimate =

Performed by: [signature]

Witnessed by: [signature]

Date: 4 August 1995.

PHASE II ACCEPTANCE TESTS 7 and 8: MSK



TEST	E_b/N_o (dB)	EXPECTED BER	MEASURED BER	ACCURACY	P_1	P_2	NBITS
7	3	3.2×10^{-2}	3.22×10^{-2}	+0.63%	0	5.38	11876.
8	5	1×10^{-2}	1×10^{-2}	± 0%	0 dB	4.04(dB)	34814.

DEVICE PARAMETERS:

DEMODULATOR: MSK

f_c = 100 MHz

TLL Bandwidth = .1 Hz z = .707

PLL Bandwidth = 1 Hz z = .707

No Limiter

I&D Detector

Min. Sig. Level = 0 dB

NOISE SOURCE: TEST 7: TO = 5.63E16 °K

TEST 8: TO = 2.29 E16 °K.

Performed by: James H. [illegible]

Witnessed by: [illegible] Beckert

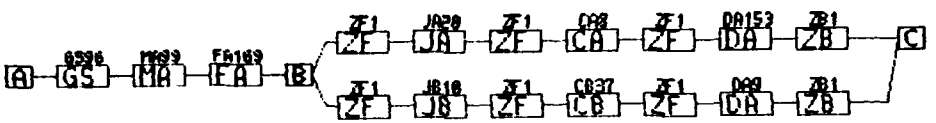
Date: 4 April 1985

APPENDIX B - ACCEPTANCE TEST DEVICE PARAMETERS

ACCEPTANCE TEST 2

TEST OF PN AND FH SPREAD

XT89



```
SH SYS

System Name                 : SYS
Editor Name                 : D0922          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 6
Creation Date               :  8 Mar 85                     BTPPTR: 369
Date of Last Run/Restart    : 20 Mar 85
# of Transmit Terminals     : 1
# of Receive Terminals      : 0              Linkage Specification    : BT
# of Satellites             : 0              TDMA 'Devices'           : (None)
# of Transmission Paths      : 1              Demand Access 'Devices'  : (None)

SYS Descriptor: ACCEPT TEST 2

     Xmit  Recv          Transmission
  #  Elem  Elem  Code    Path Devices
  1  XT89    0    C#     (None)

Display Associated Device Linkage? (Y/N): Y

     Orig  Device    Dest  Device
  #  Elem Position  Elem Position
  1   XT89   1AB1    XT89   1BC7
  2   XT89   1AB2    XT89   1BC6
  3   XT89   1BC2    XT89   1BC4
  4   XT89   1AB1    XT89   2BC7
  5   XT89   1AB2    XT89   2BC6
  6   XT89   2BC2    XT89   2BC4

ZZZZPRIV.SYST: Display Simulation Status Fields? (Y/N): Y

System  6 Run Status     : NORMAL END                Interrupt Status : CLEAR
-------------------------------------------------------------------------------
Simulation Run Title     :<ACCEPT TEST 2: PN AND FH ON BPSK NO NOISE          >
Simulation Progress . .
     - State             : CLEAR
     - Elapsed Time      : 1.09227E-04 Seconds
     - Sample Blocks     : 8
     - Percent Complete  : 100.000 %
Sampling Frequency       : 1.50000E+08 Samples/Sec
Restart Specified        : NO
Number Messages Issued   : 0
ZZZZPRIV.DATA . . . . .
    - Run Parameter Set  : 6
    - Checkpoint Status  : CRNONE

Enter FSCSS Command:
```

```
·XT89

Element Name        : XT89
Editor Name         : D0922                 ####PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       :  8 Mar 85
Date of Last Use    :  8 Mar 85             Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                     Longitude :   0 Deg   0 Min  E
Number of Segments  : 3                     Altitude  : 0.000 Kilometers

XT89 Descriptor: TEST OF PN AND FH SPREAD

     Seg   Dev
  #  Code  Count  Devices
  1    AB      3  GS96-MA99-FA169
  2    BC      7  ZF1-JA20-ZF1-CA8-ZF1-DA153-ZB1
  3   2BC      7  ZF1-JB10-ZF1-CB37-ZF1-DA9-ZB1

Enter FSCSS Command: SH GS96

Device Name         : GS96
Editor Name         : D0922
Creation Date       :  5 Mar 85
Date of Last Use    :  8 Mar 85
Current Uses        : 8
Descriptor          : TEST SPREADER PN
####PRIV.DATA: RLPNT: -1
                PFLAG:  8
                DULOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 ####PRIV.TEST: SOURCE TYPE       IG,EX,A0,A1                              IG
 DATA RATE,KBPS                          0.001 TO
                                   1000000.000                          1000.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH MA99

Device Name       : MA99
Editor Name       : D0922
Creation Date     :  4 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 10
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG: 10
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 MODULATOR TYPE                 BP,QP,QQ,MS,DP,
                                SP,16,AP,FS,CP,
                                PN,FM,PF,CU,FM,
                                PU                                          BP
 FREQUENCY, MHZ                       0.001 TO                          8000.000
                                 100000.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH FA169

Device Name       : FA169
Editor Name       : D0922
Creation Date     :  5 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 3
Descriptor        : TEST SPREADERS
####PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 FILTER TYPE                    CS,BU,BT,BE,LE,
                                PR,PZ,FS                                    CS
 CENTER FREQUENCY, MHZ                0.001 TO                          8000.000
                                 100000.000
 3-DB BANDWIDTH, MHZ                  0.001 TO                             2.000
                                    999.999
 NO. OF POLES                     1 TO     30                                11
 RIPPLE FACTOR, DB                    0.000 TO
                                      3.000                                0.010

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
CD37

Device Name       : CD37
Editor Name       : D0922
Creation Date     :  8 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 3
Descriptor        : TEST FH DESPREADER
xxxxPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Despreader
Parameter Name                    Option or Range          Default Value  Current Value
--------------                    ---------------          -------------  -------------
 DESPREADER TYPE                  PN,FH,PF                                       FH
 CENTER FREQUENCY, MHZ                  0.001 TO                               8000.000
                                  100000.000
 HOPPING FREQUENCY SPACING,MHZ          0.001 TO                                  4.000
                                    1000.000
 POWER OF 2 FOR NO OF HOP FREQ        1 TO      20                                   3
 FREQUENCY HOPPING RATE, MHZ    1.000000E-06 TO                                 1.000
                                9.999900E+01
 LENGTH FH-PR GENERATOR              10 TO      31            10                   10
 SEED FH-PR GENERATOR                    1 TO                                 12345
                                  2147483647
 MODIFY HOP ADDRESS               YE,NO                                          YE
 HOP MODIFIER BIT  1                    0,       1                                1
 HOP MODIFIER BIT  2                    0,       1                                0
 HOP MODIFIER BIT  3                    0,       1                                1

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SM JB10

Device Name       : JB10
Editor Name       : D0922
Creation Date     :  8 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 3
Descriptor        : TEST FH/BPSK
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Spreader
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 SPREADER TYPE                  PN,FH                                         FH
 FREQUENCY, MHZ                   0.001 TO                                 8000.000
                                100000.000
 HOPPING FREQ SPACING, MHZ        0.001 TO                                    4.000
                                999.999
 POWER OF 2 FOR NO OF HOP FREQ      1 TO 20                                     3
 FREQ HOPPING RATE, MHZ         1.000000E-06 TO                             1.000
                                9.999999E+01
 LENGTH FH-PR GENERATOR            10 TO 31              10                    10
 SEED FH-PR GENERATOR                 1 TO                                 12345
                                2147483647
 MODIFY HOP ADDRESS             YE,NO                                         YE
 HOP MODIFIER BIT  1               0.      1                                   1
 HOP MODIFIER BIT  2               0.      1                                   0
 HOP MODIFIER BIT  3               0.      1                                   1

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SM JA20

Device Name       : JA20
Editor Name       : D0922
Creation Date     :  4 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 4
Descriptor        : TEST PN SPREADER
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  4
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Spreader Parameter Name	Option or Range	Default Value	Current Value
SPREADER TYPE	PN,FH		PN
FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
CHIP RATE, MHZ	0.001 TO 999.999		40.000
LENGTH IN-PHASE,GEN	10 TO 31		31
LENGTH QUAD GEN	10 TO 31		31
SEED IN-PHASE GEN	1 TO 2147483647		14656
SEED QUAD GEN	1 TO 2147483647		14854

```
ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SM CAB

Device Name      : CAB
Editor Name      : D0922
Creation Date    :  4 Mar 85
Date of Last Use :  8 Mar 85
Current Uses     : 4
Descriptor       : TEST DESPREADER
****PRIV.DATA: RLPNT: -1
               PFLAG:  4
               DVLOC:   0     0

Display User Parameters? (Y/N): Y

Despreader
Parameter Name                Option or Range  Default Value  Current Value
--------------                ---------------  -------------  -------------
 DESPREADER TYPE              PN,FM,PF                              PN
 CENTER FREQUENCY, MHZ              0.001 TO
                               100000.000                       8000.000
 CHIP RATE, MHZ                     0.001 TO
                                 1000.000                         40.000
 LENGTH IN-PHASE GENERATOR     10 TO      31                          31
 LENGTH QUADRATURE GENERATOR   10 TO      31                          31
 SEED IN-PHASE GENERATOR                1 TO
                               2147483647                          14656
 SEED QUADRATURE GENERATOR              1 TO
                               2147483647                          14854
 BANDWIDTH OF TIMING LOCK LOOP      0.010 TO
                              1000000.000                          0.100
 DAMPING FACTOR TIM. LOCK LOOP      0.010 TO
                                   10.000          0.707           0.707
 FILTER 3DB BANDWIDTH, MHZ          0.001 TO
                                 1000.000                         10.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
. DA9

Device Name       : DA9
Editor Name       : D0922
Creation Date     :  5 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 3
Descriptor        : TEST DESPREADERS
###PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 DEMODULATOR TYPE               BP,DP,QP,OQ,8P,
                                16,FS,MS,CP,AP,
                                PN,FH,PF                                      BP
 FREQUENCY, MHZ                      0.001 TO                              8000.000
                                100000.000
 TYPE-TIMING LOCK LOOP          DF,PU                                         DF
 BANDWIDTH-TIMING LOCK LOOP,HZ       0.000 TO                                0.100
                                1000000.000
 DAMPING FACTOR-TIMING LOOP          0.010 TO
                                     9.990                0.707              0.707
 TYPE-PHASE LOCK LOOP           DF,PU                                         DF
 ORDER-PHASE LOCK LOOP          2 ,3                                          2
 BANDWIDTH-PHASE LOCK LOOP, HZ       0.000 TO                                1.000
                                1000000.000
 DAMPING FACTOR-PHASE LOOP           0.010 TO
                                     9.990                0.707              0.707
 AGC-TIMING & PHASE LOCK LOOPS  YE,PL,NO                                      NO
 LIMITATION AT ZERO DBW         YE,NO                                         NO
 MINIMUM SIGNAL LEVEL, DBW        -200.000 TO                                 0.000
                                     0.000
 DECISION TYPE                  HA,SO                                         HA
 DETECTOR TYPE                  ID,FS                                         ID

###PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
DA153

Device Name       : DA153
Editor Name       : D0922
Creation Date     :  4 Mar 85
Date of Last Use  :  8 Mar 85
Current Users     : 4
Descriptor        : TEST DEMOD
####PRIV.DATA: RLPNT: -1
                PFLAG:  4
                DVLOC:  0    0

Display User Parameters? (Y/N): Y
```

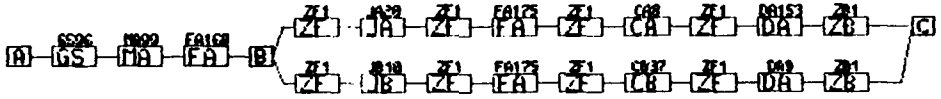
Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,QP,OQ,8P, 16,FS,MS,CP,AP, PN,FH,PF		BP
FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
TYPE-TIMING LOCK LOOP	DF,PW		DF
BANDWIDTH-TIMING LOCK LOOP,HZ	0.000 TO 1000000.000		0.100
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
TYPE-PHASE LOCK LOOP	DF,PW		DF
ORDER-PHASE LOCK LOOP	2 ,3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		10.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING & PHASE LOCK LOOPS	YE,PL,NO		NO
LIMITATION AT ZERO DBW	YE,NO		NO
MINIMUM SIGNAL LEVEL, DBW	-200.000 TO 0.000		0.000
DECISION TYPE	HA,SO		HA
DETECTOR TYPE	ID,FS		ID

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 3

ACCEPTANCE TEST 3

XT169



```
SH SY60

System Name                 : SY60
Editor Name                 : D0922          zzzzPRIV.DATA: RLPNT: -1    PFLAG: 5
Creation Date               :  8 Mar 85                     BTPPTR: 377
Date of Last Run/Restart    : 20 Mar 85
# of Transmit Terminals     : 1
# of Receive Terminals      : 0              Linkage Specification    : BT
# of Satellites             : 0              TDMA 'Devices'           : (None)
# of Transmission Paths      : 1              Demand Access 'Devices'  : (None)

SY60 Descriptor: ACCEPT TEST 3

     Xmit  Recv          Transmission
  #  Elem  Elem  Code    Path Devices
  1  XT169   0    C#     (None)

Display Associated Device Linkage? (Y/N): Y

      Orig  Device   Dest  Device
  #   Elem Position  Elem Position
  1   XT169  1AB1    XT169  1BC9
  2   XT169  1AB2    XT169  1BC8
  3   XT169  1AB2    XT169  2BC8
  4   XT169  1BC2    XT169  1BC6
  5   XT169  2BC2    XT169  2BC6
  6   XT169  1AB1    XT169  2BC9

zzzzPRIV.SYST: Display Simulation Status Fields? (Y/N): Y

System 60 Run Status     : CANCELLED                Interrupt Status : CLEAR
-------------------------------------------------------------------------------
Simulation Run Title     :<ACCEPT TEST 3 POLES AND ZEROS FILTER.              >
Simulation Progress . .
     - State             : CLEAR
     - Elapsed Time      : 4.09600E-05 Seconds
     - Sample Blocks     : 3
     - Percent Complete  : 39.000 %
Sampling Frequency       : 1.50000E+08 Samples/Sec
Restart Specified        : NO
Number Messages Issued   : 3
zzzzPRIV.DATA . . . . .
    - Run Parameter Set  : 60
    - Checkpoint Status  : CRNONE

Enter FSCSS Command:
```

```
-I XT169

Element Name        : XT169                ZZZZPRIU.DATA: RLPNT: -1    PFLAG: 1
Editor Name         : D0922
Creation Date       :  8 Mar 85            Latitude  :   0 Deg   0 Min  N
Date of Last Use    :  8 Mar 85            Longitude :   0 Deg   0 Min  E
Current Uses        : 1                    Altitude  : 0.000 Kilometers
Number of Segments  : 3

XT169 Descriptor: ACCEPT TEST 3

     Seg   Dev
  #  Code  Count  Devices
  1   AB     3    GS96-MA99-FA169
  2   BC     9    ZF1-JA20-ZF1-FA175-ZF1-CA8-ZF1-DA153-ZB1
  3  ABC     9    ZF1-JB10-ZF1-FA175-ZF1-CB37-ZF1-DA9-ZB1

Enter FSCSS Command:
```

```
SH FA175

Device Name       : FA175
Editor Name       : D0022
Creation Date     : 14 Mar 85
Date of Last Use  : 14 Mar 85
Current Uses      : 6
Descriptor        : TEST PZ DSCSIII
ZZZ:PRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:  0    0

Display User Parameters? (Y/N): Y
```

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		PZ
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		61.600
NO. OF POLES	4 TO 30		6
NO. OF ZEROS	1 TO 30		2
POLE 1			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-2.295
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		5.385
POLE 2			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-2.295
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-5.385
POLE 3			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-3.778
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		8.138
POLE 4			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-3.778
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-8.138
POLE 5			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-0.643
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-6.624
POLE 6			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-0.643
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		6.624
ZERO 1			
- REAL ZERO	-9.999999E+37 TO 9.999999E+37		0.000
- IMAGINARY ZERO	-9.999999E+37 TO 9.999999E+37		8.765
ZERO 2			
- REAL ZERO	-9.999999E+37 TO 9.999999E+37		0.000
- IMAGINARY ZERO	-9.999999E+37 TO 9.999999E+37		-8.765

```
ZZZ:PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

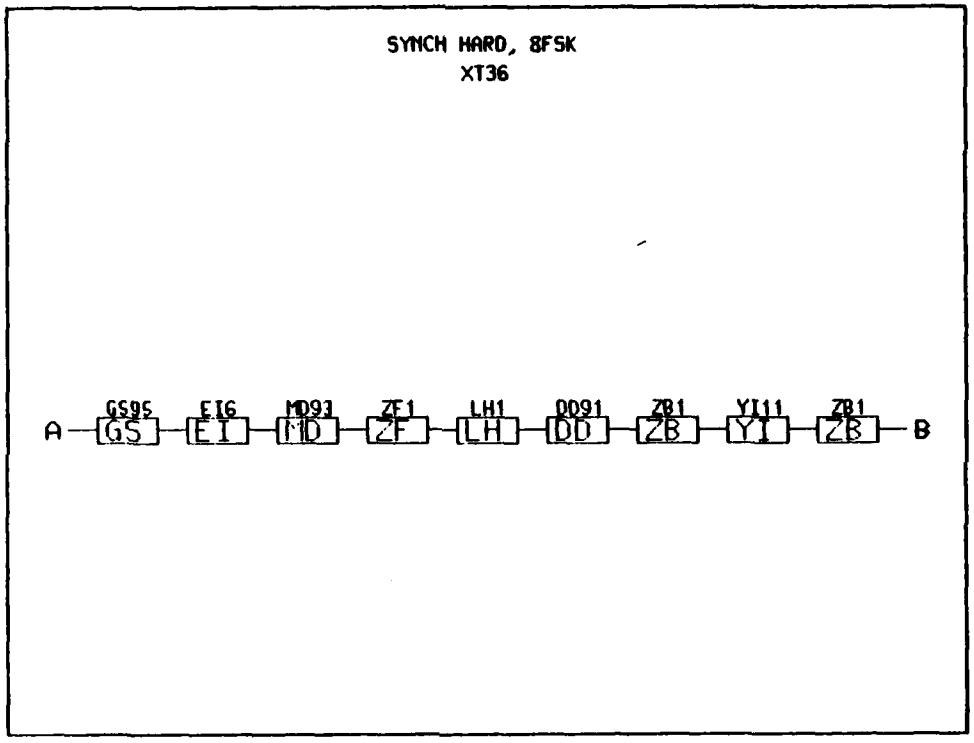
```
-1 FA175

Device Name       : FA175
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 14 Mar 85
Current Uses      : 6
Descriptor        : TEST P2 DSCSIII
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		PZ
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		61.600
NO. OF POLES	4 TO 30		6
NO. OF ZEROS	1 TO 30		2
POLE 1			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-2.295
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		5.385
POLE 2			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-2.295
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-5.385
POLE 3			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-3.778
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		2.138
POLE 4			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-3.778
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-2.138
POLE 5			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-0.643
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-6.624

```
POLE
```

```
POLE  6
 - REAL POLE                    -9.999999E+37 TO
                                 9.999999E+37          -0.643
 - IMAGINARY POLE               -9.999999E+37 TO
                                 9.999999E+37           6.624

ZERO  1
 - REAL ZERO                    -9.999999E+37 TO
                                 9.999999E+37           0.000
 - IMAGINARY ZERO               -9.999999E+37 TO
                                 9.999999E+37           8.765

ZERO  2
 - REAL ZERO                    -9.999999E+37 TO
                                 9.999999E+37           0.000
 - IMAGINARY ZERO               -9.999999E+37 TO
                                 9.999999E+37          -8.765

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 4


SYNCH HARD, 8FSK
XT36
GS95
EI6
MD93
ZF1
LH1
DD91
ZB1
YI11
ZB1
A
GS
EI
MD
ZF
LH
DD
ZB
YI
ZB
B

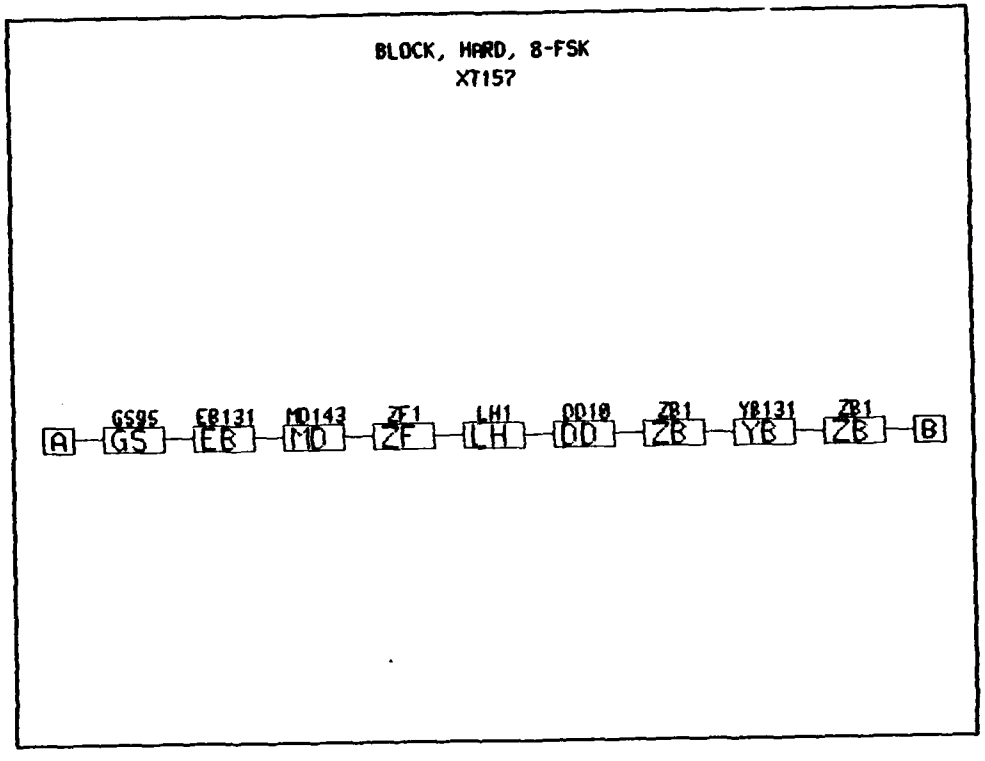
```
SH XT36
                                                ####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): 
Element Name        : XT36
Editor Name         : FSCSS2            ####PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 18 Mar 85
Date of Last Use    : 23 Mar 85         Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                 Longitude :   0 Deg   0 Min  E
Number of Segments  : 1                 Altitude  : 0.000 Kilometers

XT36 Descriptor: SYNCH HARD, BFSK

     Seg   Dev
  #  Code  Count  Devices
  1    AB      9  GS95-EI6-MD93-ZF1-LM1-DD91-ZB1-VI11-ZB1

Enter FSCSS Command: SH GS95

Device Name       : GS95
Editor Name       : D0279
Creation Date     : 28 Jan 85
Date of Last Use  :  2 Apr 85
Current Uses      : 33
Descriptor        : 2.4 KBPS FOR SYNCH INTER
####PRIV.DATA: RLPNT: -1
                PFLAG: 33
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 ####PRIV.TEST: SOURCE TYPE       IG,EX,A0,A1                              IG
 DATA RATE,KBPS                          0.001 TO
                                   1000000.000                             2.400

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH EI6

Device Name       : EI6
Editor Name       : D0279
Creation Date     : 22 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 11
Descriptor        : 6 X 13 SYNCH INTLVR
####PRIV.DATA: RLPNT: -1
                PFLAG: 11
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 ENCODER TYPE                     DF,CN,BI,SI,BS                           SI
 NUMBER OF TAPS                        1 TO    99                             6
 OUTPUT BIT SEPARATION                13 TO   501                            13
```

```
SM MD93

Device Name       : MD93
Editor Name       : FSCSS2
Creation Date     : 23 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 7
Descriptor        : 150 MHZ, 50.1 KHZ, 8-FSK
####PRIV.DATA: RLPNT: -1
                PFLAG:  7
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FM,PF,CU,FM,
                                PU                                          FS
 FREQUENCY, MHZ                      0.001 TO
                                100000.000                                150.000
 ALPHABET SIZE                     2,     4,
                                   8,    16                                  8
 FREQUENCY SPACING,KHZ               0.001 TO
                                  9999.999                                 50.100
 INPUT SYMBOL TYPE              BI,SY                                        BI

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH DD91

Device Name       : DD91
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 5
Descriptor        : 150, 50.1 KHZ, 8-FSK, HA
****PRIV.DATA: RLPNT: -1
               PFLAG:  5
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name                    Option or Range  Default Value  Current Value
--------------                    ---------------  -------------  -------------
 DEMODULATOR TYPE                 BP,DP,QP,OQ,8P,
                                  16,FS,MS,CP,AP,
                                  PM,FH,PF                              FS
 FREQUENCY, MHZ                         0.001 TO
                                    100000.000                      150.000
 ALPHABET SIZE                          2,      4,
                                        8,     16                         8
 FREQUENCY SPACING, KHZ                 0.001 TO
                                     9999.999                        50.100
 BANDWIDTH-TIMING LOCK LOOP,HZ          0.000 TO
                                  1000000.000                         0.000
 DAMPING FACTOR-TIMING LOOP             0.010 TO
                                        9.990          0.707          0.707
 AGC-TIMING LOCK LOOP             YE,NO                             NO
 LIMITATION AT ZERO DBW           YE,NO                             VE
 DECISION TYPE                    HA,SO                             HA

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SM VI11

Device Name       : VI11
Editor Name       : D0279
Creation Date     :  2 Apr 85
Date of Last Use  : 22 Mar 85
Current Uses      : 9
Descriptor        : 6 x 13 SYNCH, HARD
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  9
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Decoder
Parameter Name                 Option or Range   Default Value  Current Value
---------------                ---------------   -------------  -------------
 DECODER TYPE                  DF,CN,BI,SI,SB                         SI
 NUMBER OF TAPS                   1 TO     99                             6
 OUTPUT BIT SEPARATION           13 TO    501                            13
 INPUT SYMBOL DECISIONS        HA,SO                                    HA

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

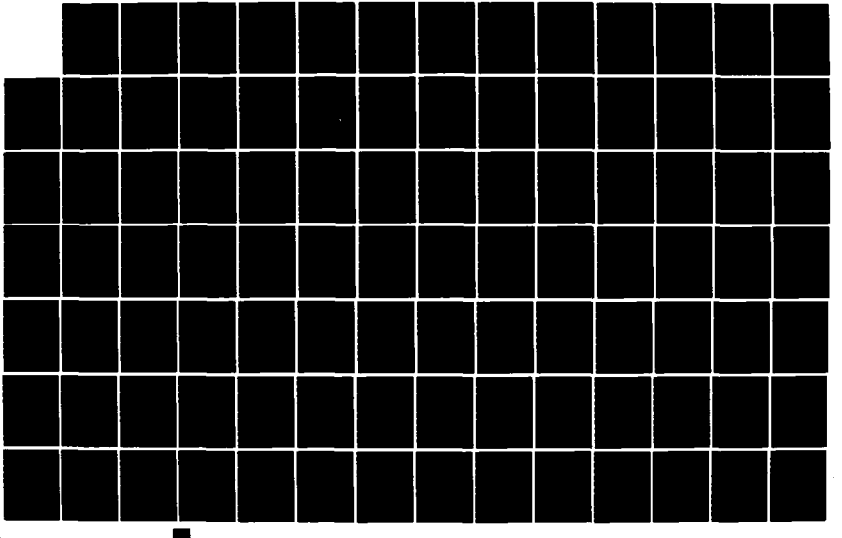
ACCEPTANCE TEST 5

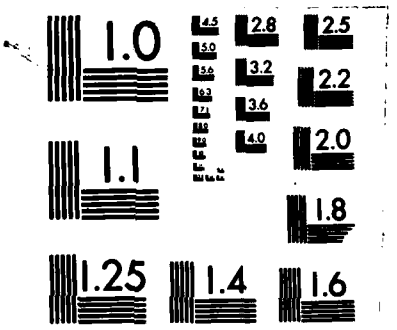

BLOCK, HARD, 8-FSK
XT157
A
GS
GS95
EB
EB131
MD
MD143
ZF
ZF1
LH
LH1
DD
DD10
ZB
ZB1
YB
YB131
ZB
ZB1
B

```
Enter FSCSS Command: sh xt157

Element Name        : XT157
Editor Name         : FSCSS2                ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 0
Creation Date       : 28 Mar 85
Date of Last Use    : 28 Mar 85             Latitude  :   0 Deg   0 Min  N
Current Uses        : 0                     Longitude :   0 Deg   0 Min  E
Number of Segments  : 1                     Altitude  : 0.000 Kilometers

XT157 Descriptor: BLOCK, HARD, 8-FSK

      Seg   Dev
  #  Code  Count  Devices
  1    AB      9  GS95-EB131-MD143-ZF1-LH1-DD10-ZB1-YB131-ZB1

Enter FSCSS Command: sh gs95

Device Name         : GS95
Editor Name         : D0279
Creation Date       : 28 Jan 85
Date of Last Use    :  2 Apr 85
Current Uses        : 34
Descriptor          : 2.4 KBPS FOR SYNCH INTER
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG: 34
               DULOC:   0    0

Display User Parameters? (Y/N): y

Data Source
Parameter Name                    Option or Range  Default Value  Current Value
--------------                    ---------------  -------------  -------------
 ZZZZPRIV.TEST: SOURCE TYPE       IG,EX,A0,A1                            IG
 DATA RATE,KBPS                          0.001 TO
                                 1000000.000                           2.400

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:
```

AD-A155 647 FLEXIBLE SATELLITE COMMUNICATIONS SYSTEMS SIMULATOR(U) 2/3
COMPUTER SCIENCES CORP FALLS CHURCH VA SYSTEMS DIV
D F ARNAUD ET AL. 16 MAY 85 DCA100-77-C-0020

UNCLASSIFIED F/G 17/2 NL





```
Enter FSCSS Command: sh eb131

Device Name       : EB131
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 1
Descriptor        : 8 X 32 BLK, 2 REPS HARD
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): y

Encoder
Parameter Name                 Option or Range   Default Value  Current Value
--------------                 ---------------   -------------  -------------
 ENCODER TYPE                  DF,CN,BI,SI,BS                          BI
 NUMBER OF ROWS                    1 TO   200                           8
 NUMBER OF COLUMNS                 1 TO   300                          32
 NUMBER OF REPETITIONS             0 TO    15                           2

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command: sh md93

Device Name       : MD93
Editor Name       : FSCSS2
Creation Date     : 23 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 7
Descriptor        : 150 MHZ, 50.1 KHZ, 8-FSK
####PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:   0    0

Display User Parameters? (Y/N): y

Modulator
Parameter Name                 Option or Range   Default Value  Current Value
--------------                 ---------------   -------------  -------------
 MODULATOR TYPE                BP,QP,OQ,MS,DP,
                               8P,16,AP,FS,CP,
                               PN,FH,PF,CW,FM,
                               PU                                      FS
 FREQUENCY, MHZ                    0.001 TO                      150.000
                              100000.000
 ALPHABET SIZE                     2,    4,                            8
                                   8,   16
 FREQUENCY SPACING,KHZ             0.001 TO                       50.100
                                9999.999
 INPUT SYMBOL TYPE             BI,SY                                   BI

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:
```

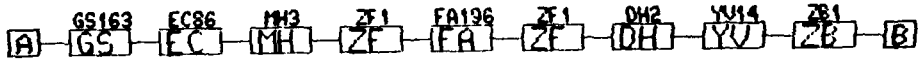
```
Enter FSCSS Command: sh dd91

Device Name       : DD91
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  2 Apr 85
Current Uses      : 5
Descriptor        : 150, 50.1 KHZ, 8-FSK, HA
****PRIV.DATA: RLPNT: -1
               PFLAG:  5
               DVLOC:    0    0

Display User Parameters? (Y/N): y

Demodulator
Parameter Name                  Option or Range   Default Value  Current Value
--------------                  ---------------   -------------  -------------
 DEMODULATOR TYPE               BP,DP,QP,OQ,SP,
                                16,FS,MS,CP,AP,
                                PN,FH,PF                          FS
 FREQUENCY, MHZ                      0.001 TO
                                100000.000                        150.000
 ALPHABET SIZE                       2,      4,
                                     8,     16                         8
 FREQUENCY SPACING, KHZ              0.001 TO
                                  9999.999                         50.100
 BANDWIDTH-TIMING LOCK LOOP,HZ       0.000 TO
                               1000000.000                          0.000
 DAMPING FACTOR-TIMING LOOP          0.010 TO
                                     0.990        0.707             0.707
 AGC-TIMING LOCK LOOP           YE,NO                             NO
 LIMITATION AT ZERO DBW         YE,NO                             YE
 DECISION TYPE                  HA,SO                             HA

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:
```

```
Enter FSCSS Command: sh yb131

Device Name       : YB131
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 1
Descriptor        : 8 X 32 BLK, HARD 2 REPS
zzzzPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): y

Decoder
Parameter Name                 Option or Range  Default Value  Current Value
--------------                 ---------------  -------------  -------------
 DECODER TYPE                  DF,CN,BI,SI,SB                        BI
 NUMBER OF ROWS                   1 TO   200                           8
 NUMBER OF COLUMNS                1 TO   300                          32
 NUMBER OF REPETITIONS            0 TO    15                           2
 INPUT SYMBOL DECISIONS        HA,SO                                 HA

zzzzPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:
```

ACCEPTANCE TEST 7A

TEST PN-FH SOFT

TX58



```
--SY9

System Name                : SY9
Editor Name                : FSCSS2        zzzzPRIV.DATA: RLPNT: -1    PFLAG: 7
Creation Date              : 18 Mar 85                    DTPPTR: 462
Date of Last Run/Restart   : 26 Mar 85
# of Transmit Terminals   : 1
# of Receive Terminals    : 0             Linkage Specification    : BT
# of Satellites           : 0             TDMA "Devices"           : (None)
# of Transmission Paths    : 1             Demand Access "Devices" : (None)

SY9 Descriptor: TEST PF SOFT

     Xmit  Recv          Transmission
  #  Elem  Elem  Code    Path Devices
  1  XT58    0    B#     (None)

Display Associated Device Linkage? (Y/N): Y

      Orig  Device    Dest  Device
  #   Elem Position  Elem Position
  1   XT58   1AB1    XT58   1AB9
  2   XT58   1AB3    XT58   1AB7
  3   XT58   1AB2    XT58   1AB8

zzzzPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT58

Element Name         : XT58
Editor Name          : FSCSS2          zzzzPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date        : 18 Mar 85
Date of Last Use     : 18 Mar 85       Latitude  :   0 Deg   0 Min  N
Current Uses         : 1               Longitude :   0 Deg   0 Min  E
Number of Segments   : 1               Altitude  : 0.000 Kilometers

XT58 Descriptor: TEST PH SOFT

      Seg   Dev
  #  Code  Count  Devices
  1    AB      9  GS163-EC86-MH3-ZF1-FA196-ZF1-DH2-YU14-ZB1

Enter FSCSS Command:
```

```
.GS163

Device Name       : GS163
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 9
Descriptor        : TEST PN/FH SOFT
****PRIV.DATA: RLPNT: -1
               PFLAG:  9
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name              Option or Range   Default Value   Current Value
--------------              ---------------   -------------   -------------
 ****PRIV.TEST: SOURCE TYPE  IG,EX,A0,A1                           IG
 DATA RATE,KBPS                   0.001 TO
                             1000000.000                        250.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MH3

Device Name       : MH3
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 9
Descriptor        : TEST SOFT DECISION
****PRIV.DATA: RLPNT: -1
               PFLAG:  9
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name              Option or Range   Default Value   Current Value
--------------              ---------------   -------------   -------------
 MODULATOR TYPE             BP,QP,OQ,MS,DP,
                            8P,16,AP,FS,CP,
                            PN,FH,PF,CW,FM,
                            PU                                     PF
 FREQUENCY, MHZ                  0.001 TO
                              100000.000                       8000.000
 CHIP RATE, MHZ                  0.001 TO
                                 999.999                          5.000
 LENGTH IN-PHASE,GEN          10 TO     31                           31
 LENGTH QUAD GEN              10 TO     31                           31
 SEED IN-PHASE GEN                    1 TO
                              2147483647                      101010101
 SEED QUAD GEN                        1 TO
                              2147483647                      101010101
 HOPPING FREQ SPACING, MHZ       0.001 TO
                                 999.999                          5.000
 POWER OF 2 FOR NO OF HOP FREQ  1 TO    20                            2
 FREQ HOPPING RATE, MHZ     1.000000E-06 TO
                                                    9.999000E+01
                                                       1.000
 LENGTH FH-PR GENERATOR                              10 TO     31
 10                                    10
 SEED FH-PR GENERATOR                                        1 TO
                                                    2147483647
                                1010101010
 MODIFY HOP ADDRESS                                  YE,NO
                                    NO

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SM FA196

Device Name      : FA196
Editor Name      : D0922
Creation Date    : 26 Mar 85
Date of Last Use : 28 Mar 85
Current Uses     : 8
Descriptor       : TEST PM/FM SOFT
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  8
               DVLOC:    0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                 Option or Range  Default Value  Current Value
--------------                 ---------------  -------------  -------------
 FILTER TYPE                   CS,BU,BT,BE,LE,
                               PR,PZ,FS                              BU
 CENTER FREQUENCY, MHZ              0.001 TO
                               100000.000                        8000.000
 3-DB BANDWIDTH, MHZ                0.001 TO
                                  999.999                          40.000
 NO. OF POLES                     1 TO     30                          4

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
DH2                                                    .nter FSCSS Command:

Device Name       : DH2
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 20 Mar 85
Current Users     : 7
Descriptor        : TEST PF SOFT
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,QP,OQ,8P,16,FS,MS,CP,AP,PN,FH,PF		PF
FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
CHIP RATE, MHZ	0.001 TO 999.999		5.000
LENGTH IN-PHASE GENERATOR	10 TO 31		31
LENGTH QUAD PN GENERATOR	10 TO 31		31
SEED IN-PHASE GENERATOR	1 TO 2147483647		101010101
SEED QUAD PN GENERATOR	1 TO 2147483647		101010101
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		5.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		2
FREQ HOPPING RATE, MHZ	1.000000E-06 TO 9.999900E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31	10	10
SEED FH-PR GENERATOR	1 TO 2147483647		1010101010
MODIFY HOP ADDRESS	YE,NO		NO
TYPE-TIMING LOCK LOOP	DF,PU		DF
BANDWIDTH-TIMING LOCK LOOP,HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
TYPE-PHASE LOCK LOOP	DF,PU		DF
ORDER-PHASE LOCK LOOP	2 ,3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING & PHASE LOCK LOOPS	YE,PL,NO		NO
LIMITATION AT ZERO DBW	YE,NO		NO
MINIMUM SIGNAL LEVEL, DBW	-200.000 TO 0.000		-10.000
DECISION TYPE	HA,SO		SO

```
$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N
```

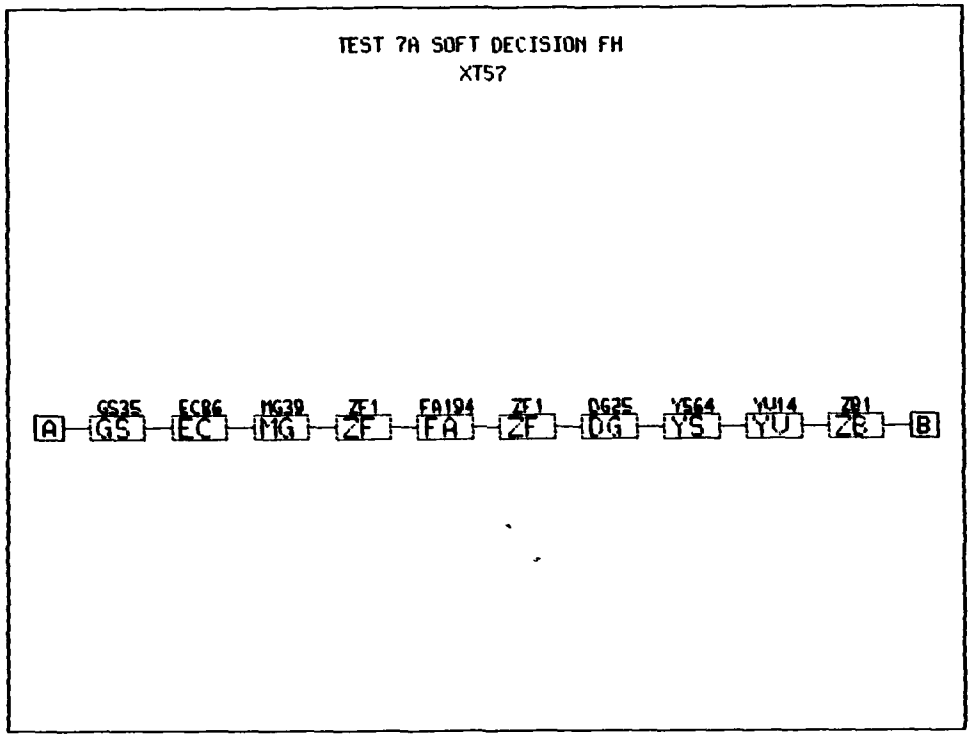
```
SH VU14

Device Name       : VU14
Editor Name       : D0922
Creation Date     : 12 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 22
Descriptor        : TEST VA HARD
###PRIV.DATA: RLPNT: -1
               PFLAG: 22
               DULOC:   0    0

Display User Parameters? (Y/N): Y
```

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO	SO	
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	VM,VD	VM	
QUANT THRESH SPACING	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999990E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999990E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999990E+37		1.000
-METRIC 2	0.00		

```
-METRIC 2                    0.000000E+00 TO
                              9.999990E+37          6.000

 METRIC ASSIGNMENT 3
  -METRIC 1                   0.000000E+00 TO
                              9.999990E+37          2.000
  -METRIC 2                   0.000000E+00 TO
                              9.999990E+37          5.000

 METRIC ASSIGNMENT 4
  -METRIC 1                   0.000000E+00 TO
                              9.999990E+37          3.000
  -METRIC 2                   0.000000E+00 TO
                              9.999990E+37          4.000

 METRIC ASSIGNMENT 5
  -METRIC 1                   0.000000E+00 TO
                              9.999990E+37          4.000
  -METRIC 2                   0.000000E+00 TO
                              9.999990E+37          3.000

 METRIC ASSIGNMENT 6
  -METRIC 1                   0.000000E+00 TO
                              9.999990E+37          5.000
  -METRIC 2                   0.000000E+00 TO
                              9.999990E+37          2.000

 METRIC ASSIGNMENT 7
  -METRIC 1                   0.000000E+00 TO
                              9.999990E+37          6.000
  -METRIC 2                   0.000000E+00 TO
                              9.999990E+37          1.000

 METRIC ASSIGNMENT 8
  -METRIC 1                   0.000000E+00 TO
                              9.999990E+37          7.000
  -METRIC 2                   0.000000E+00 TO
                              9.999990E+37          0.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
.SH EC86

Device Name       : EC86
Editor Name       : D0922
Creation Date     :  5 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 27
Descriptor        : TEST VA
XXXPRIV.DATA: RLPNT: -1
              PFLAG: 27
              DULOC:   0    0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name                    Option or Range  Default Value  Current Value
--------------                    ---------------  -------------  -------------
 ENCODER TYPE                     DF,CN,BI,SI,BS                        CN
 INPUT RATE                          1 TO     3                          1
 OUTPUT RATE                         2 TO     4                          2
 CONSTRAINT LENGTH                   2 TO     9                          7

 1 POLYNOMIAL COEFFICIENT 1          0,       1                          1
 1 POLYNOMIAL COEFFICIENT 2          0,       1                          1
 1 POLYNOMIAL COEFFICIENT 3          0,       1                          1
 1 POLYNOMIAL COEFFICIENT 4          0,       1                          1
 1 POLYNOMIAL COEFFICIENT 5          0,       1                          0
 1 POLYNOMIAL COEFFICIENT 6          0,       1                          0
 1 POLYNOMIAL COEFFICIENT 7          0,       1                          1

 2 POLYNOMIAL COEFFICIENT 1          0,       1                          1
 2 POLYNOMIAL COEFFICIENT 2          0,       1                          0
 2 POLYNOMIAL COEFFICIENT 3          0,       1                          1
 2 POLYNOMIAL COEFFICIENT 4          0,       1                          1
 2 POLYNOMIAL COEFFICIENT 5          0,       1                          0
 2 POLYNOMIAL COEFFICIENT 6          0,       1                          1
 2 POLYNOMIAL COEFFICIENT 7          0,       1                          1

XXXPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 7B


TEST 7A SOFT DECISION FH
XT57
GS35
EC86
MG39
ZF1
FA194
ZF1
DG25
YS64
YU14
ZB1
A
GS
EC
MG
ZF
FA
ZF
DG
YS
YU
ZB
B

```
SH SY7

System Name                 : SY7
Editor Name                 : FSCSS2        ####PRIV.DATA: RLPNT: -1    PFLAG: 6
Creation Date               : 18 Mar 85                    BTPPTR: 460
Date of Last Run/Restart    : 26 Mar 85
# of Transmit Terminals     : 1
# of Receive Terminals      : 0             Linkage Specification    : BT
# of Satellites             : 0             TDMA "Devices"           : (None)
# of Transmission Paths     : 1             Demand Access "Devices"  : (None)

SY7 Descriptor: TEST FH SOFT

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT57    0    BI   (None)

Display Associated Device Linkage? (Y/N): Y

      Orig  Device   Dest  Device
  #   Elem Position  Elem Position
  1   XT57   1AB1    XT57   1AB10
  2   XT57   1AB2    XT57   1AB9
  3   XT57   1AB3    XT57   1AB7

####PRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT57

Element Name        : XT57
Editor Name         : FSCSS2            ####PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 18 Mar 85
Date of Last Use    : 18 Mar 85         Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                 Longitude :   0 Deg   0 Min  E
Number of Segments  : 1                 Altitude  : 0.000 Kilometers

XT57 Descriptor: TEST FH SOFT

      Seg   Dev
  #  Code  Count  Devices
  1    AB    10   GS3S-EC86-MG39-ZF1-FA194-ZF1-DG25-YS64-YU14-ZB1

Enter FSCSS Command: Y
Unrecognized Command

Enter FSCSS Command: N
Unrecognized Command

Enter FSCSS Command:
```

```
-4 GS35

Device Name       : GS35
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:    0     0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range   Default Value   Current Value
--------------                  ---------------   -------------   -------------
 $$$$PRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                             IG
 DATA RATE,KBPS                       0.001 TO
                                  1000000.000                       250.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MG39

Device Name       : MG39
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST SOFT DECISION ON FH
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:    0     0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range   Default Value   Current Value
--------------                  ---------------   -------------   -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                SP,16,AP,FS,CP,
                                PN,FH,PF,CU,FM,
                                PU                                      FH
 FREQUENCY, MHZ                       0.001 TO
                                  100000.000                       7900.000
 HOPPING FREQ SPACING, MHZ            0.001 TO
                                     999.999                          2.000
 POWER OF 2 FOR NO OF HOP FREQ      1 TO     20                           2
 FREQ HOPPING RATE, MHZ         1.000000E-06 TO
                                9.999900E+01                          1.000
 LENGTH FH-PR GENERATOR            10 TO     31        10                10
 SEED FH-PR GENERATOR                        1 TO
                                  2147483647                          10101
 MODIFY HOP ADDRESS             YE,NO                                   NO
 ALPHABET SIZE M-ARY FSK               2.      4.
                                       8.     16                          2
 FSK TONE SPACING, KHZ                0.001 TO
                                     9999.999
                                      500.000
 INPUT SYMBOL TYPE              BI,SY
                                        SY

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
: FA194

Device Name       : FA194
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST SOFT
zzzzPRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:  0    0

Display User Parameters? (Y/N): Y
```

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE	CS,BW,BT,BE,LE, PR,PZ,FS		BW
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		7900.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		50.000
NO. OF POLES	1 TO 30		11

```
zzzzPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SN YU14

Device Name       : YU14
Editor Name       : D0922
Creation Date     : 12 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 22
Descriptor        : TEST VA HARD
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG: 22
               DULOC:   0    0

Display User Parameters? (Y/N): Y
```

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	UM,UD		UM
QUANT THRESH SPACING	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999999E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999999E+37		1.000
-METRIC 2	0.00		

```
-METRIC 2                    0.000000E+00 TO
                             9.999990E+37          6.000

 METRIC ASSIGNMENT 3
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37          2.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37          5.000

 METRIC ASSIGNMENT 4
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37          3.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37          4.000

 METRIC ASSIGNMENT 5
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37          4.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37          3.000

 METRIC ASSIGNMENT 6
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37          5.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37          2.000

 METRIC ASSIGNMENT 7
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37          6.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37          1.000

 METRIC ASSIGNMENT 8
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37          7.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37          0.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
.SH EC86

Device Name       : EC86
Editor Name       : D0922
Creation Date     :  5 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 27
Descriptor        : TEST VA
$$$$PRIV.DATA: RLPNT: -1
               PFLAG: 27
               DVLOC:    0     0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name                          Option or Range   Default Value  Current Value
--------------                          ---------------   -------------  -------------
 ENCODER TYPE                           DF,CN,BI,SI,BS                        CN
 INPUT RATE                                1 TO      3                          1
 OUTPUT RATE                               2 TO      4                          2
 CONSTRAINT LENGTH                         2 TO      9                          7

 1 POLYNOMIAL COEFFICIENT 1                0,        1                          1
 1 POLYNOMIAL COEFFICIENT 2                0,        1                          1
 1 POLYNOMIAL COEFFICIENT 3                0,        1                          1
 1 POLYNOMIAL COEFFICIENT 4                0,        1                          1
 1 POLYNOMIAL COEFFICIENT 5                0,        1                          0
 1 POLYNOMIAL COEFFICIENT 6                0,        1                          0
 1 POLYNOMIAL COEFFICIENT 7                0,        1                          1

 2 POLYNOMIAL COEFFICIENT 1                0,        1                          1
 2 POLYNOMIAL COEFFICIENT 2                0,        1                          0
 2 POLYNOMIAL COEFFICIENT 3                0,        1                          1
 2 POLYNOMIAL COEFFICIENT 4                0,        1                          1
 2 POLYNOMIAL COEFFICIENT 5                0,        1                          0
 2 POLYNOMIAL COEFFICIENT 6                0,        1                          1
 2 POLYNOMIAL COEFFICIENT 7                0,        1                          1

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 7C

```
SV18

System Name              : SV18
Editor Name              : FSCSS2        ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date            : 22 Mar 85                    BTPPTR: 490
Date of Last Run/Restart : 26 Mar 85
# of Transmit Terminals  : 1
# of Receive Terminals   : 0             Linkage Specification    : BT
# of Satellites          : 0             TDMA "Devices"           : (None)
# of Transmission Paths  : 1             Demand Access "Devices" : (None)

SV18 Descriptor: TEST SD OF DPSK

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT98    0    BI   (None)

Display Associated Device Linkage? (Y/N): Y

      Orig  Device   Dest  Device
  #   Elem Position  Elem Position
  1   XT98   1AB1    XT98   1AB8
  2   XT98   1AB2    XT98   1AB7
  3   XT98   1AB3    XT98   1AB6

ZZZZPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT98

Element Name        : XT98
Editor Name         : FSCSS2            ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 22 Mar 85
Date of Last Use    : 22 Mar 85         Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                 Longitude :   0 Deg   0 Min  E
Number of Segments  : 1                 Altitude  : 0.000 Kilometers

XT98 Descriptor: TEST SD OF DPSK.

      Seg   Dev
  #  Code  Count  Devices
  1    AB      8  GS39-EC86-MB29-FA19S-ZF1-DB20-YU14-ZB1

Enter FSCSS Command: Y
Unrecognized Command

Enter FSCSS Command:
```

```
-1 GS39

Device Name       : GS39
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 6
Descriptor        : TEST DPSK
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 ZZZZPRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                             IG
 DATA RATE,KBPS                       0.001 TO
                                1000000.000                          250.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MB29

Device Name       : MB29
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 6
Descriptor        : TEST DP SOFT
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FH,PF,CU,FM,
                                PU                                      DP
 FREQUENCY, MHZ                       0.001 TO
                                 100000.000                         8040.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
-| FA195

Device Name      : FA195
Editor Name      : D0922
Creation Date    : 28 Mar 85
Date of Last Use : 28 Mar 85
Current Uses     : 7
Descriptor       : TEST DPSK
****PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:    0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                      Option or Range   Default Value  Current Value
--------------                      ---------------   -------------  -------------
 FILTER TYPE                        CS,BU,BT,BE,LE,
                                    PR,PZ,FS                              CS
 CENTER FREQUENCY, MHZ                   0.001 TO
                                     100000.000                       8040.000
 3-DB BANDWIDTH, MHZ                     0.001 TO
                                       999.999                           4.000
 NO. OF POLES                        1 TO      30                           30
 RIPPLE FACTOR, DB                       0.000 TO
                                         3.000                           0.100

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH DB20

Device Name          : DB20
Editor Name          : D0922
Creation Date        : 26 Mar 85
Date of Last Use     : 22 Mar 85
Current Uses         : 6
Descriptor           : TEST VA DPSK
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,QP,OQ,8P, 16,FS,MS,CP,AP, PN,FM,PF		DP
FREQUENCY, MHZ	0.001 TO 100000.000		8040.000
TYPE-TIMING LOCK LOOP	DF,PW		DF
BANDWIDTH-TIMING LOCK LOOP,HZ	0.000 TO 1000000.000		0.100
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING LOCK LOOP	YE,NO		NO
LIMITATION AT ZERO DBW	YE,NO		NO
MINIMUM SIGNAL LEVEL, DBW	-200.000 TO 0.000		0.000
DECISION TYPE	HA,SO		SO

```
ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SN YU14

Device Name       : YU14
Editor Name       : D0922
Creation Date     : 12 Mar 85
Date of Last Use  : 22 Mar 85
Current Users     : 22
Descriptor        : TEST VA HARD
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG: 22
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	VM,VD		VM
QUANT THRESH SPACING	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999990E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999990E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999990E+37		1.000
-METRIC 2	0.00		

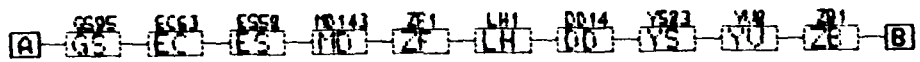
```
-METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    6.000
 METRIC ASSIGNMENT 3
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37                    2.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    5.000
 METRIC ASSIGNMENT 4
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37                    3.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    4.000
 METRIC ASSIGNMENT 5
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37                    4.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    3.000
 METRIC ASSIGNMENT 6
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37                    5.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    2.000
 METRIC ASSIGNMENT 7
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37                    6.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    1.000
 METRIC ASSIGNMENT 8
  -METRIC 1                  0.000000E+00 TO
                             9.999990E+37                    7.000
  -METRIC 2                  0.000000E+00 TO
                             9.999990E+37                    0.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
.SH EC86

Device Name       : EC86
Editor Name       : D0922
Creation Date     :  5 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 27
Descriptor        : TEST VA
%%%PRIV.DATA: RLPNT: -1
              PFLAG: 27
              DVLOC:   0    0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name                    Option or Range   Default Value  Current Value
--------------                    ---------------   -------------  -------------
 ENCODER TYPE                     DF,CN,BI,SI,BS                         CN
 INPUT RATE                          1 TO      3                          1
 OUTPUT RATE                         2 TO      4                          2
 CONSTRAINT LENGTH                   2 TO      9                          7

 1 POLYNOMIAL COEFFICIENT 1          0,        1                          1
 1 POLYNOMIAL COEFFICIENT 2          0,        1                          1
 1 POLYNOMIAL COEFFICIENT 3          0,        1                          1
 1 POLYNOMIAL COEFFICIENT 4          0,        1                          1
 1 POLYNOMIAL COEFFICIENT 5          0,        1                          0
 1 POLYNOMIAL COEFFICIENT 6          0,        1                          0
 1 POLYNOMIAL COEFFICIENT 7          0,        1                          1

 2 POLYNOMIAL COEFFICIENT 1          0,        1                          1
 2 POLYNOMIAL COEFFICIENT 2          0,        1                          0
 2 POLYNOMIAL COEFFICIENT 3          0,        1                          1
 2 POLYNOMIAL COEFFICIENT 4          0,        1                          1
 2 POLYNOMIAL COEFFICIENT 5          0,        1                          0
 2 POLYNOMIAL COEFFICIENT 6          0,        1                          1
 2 POLYNOMIAL COEFFICIENT 7          0,        1                          1

%%%PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 7D

8-FSK SYMBOL INPUT SOFT DECISION DECODING

XT25



```
SH XT25

Element Name        : XT25
Editor Name         : D0279                 ####PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 16 Mar 85
Date of Last Use    : 16 Mar 85             Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                     Longitude :   0 Deg   0 Min  E
Number of Segments  : 1                     Altitude  : 0.000 Kilometers

XT25 Descripter: VIT SO. TEST, 8-FSK SYMB

     Seg   Dev
  #  Code  Count  Devices
  1    AB    10   GS95-EC63-ES58-MD143-ZF1-LH1-DD14-VS83-YV8-ZB1

Enter FSCSS Command: SH GS95

Device Name         : GS95
Editor Name         : D0279
Creation Date       : 28 Jan 85
Date of Last Use    :  2 Apr 85
Current Uses        : 33
Descriptor          : 2.4 KBPS FOR SYNCH INTER
####PRIV.DATA: RLPNT: -1
                PFLAG: 33
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 ####PRIV.TEST: SOURCE TYPE       IG,EX,A0,A1                              IG
 DATA RATE,KBPS                          0.001 TO
                                   1000000.000                            2.400

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH EC63

Device Name      : EC63
Editor Name      : D0279
Creation Date    : 22 Feb 85
Date of Last Use : 26 Mar 85
Current Uses     : 11
Descriptor       : VIT R-1/2,LEN-7 CODER
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG: 11
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name                    Option or Range   Default Value  Current Value
--------------                    ---------------   -------------  -------------
ENCODER TYPE                      DF,CN,BI,SI,BS                        CN
INPUT RATE                           1 TO     3                          1
OUTPUT RATE                          2 TO     4                          2
CONSTRAINT LENGTH                    2 TO     9                          7

1 POLYNOMIAL COEFFICIENT 1           0,       1                          1
1 POLYNOMIAL COEFFICIENT 2           0,       1                          1
1 POLYNOMIAL COEFFICIENT 3           0,       1                          1
1 POLYNOMIAL COEFFICIENT 4           0,       1                          1
1 POLYNOMIAL COEFFICIENT 5           0,       1                          0
1 POLYNOMIAL COEFFICIENT 6           0,       1                          0
1 POLYNOMIAL COEFFICIENT 7           0,       1                          1

2 POLYNOMIAL COEFFICIENT 1           0,       1                          1
2 POLYNOMIAL COEFFICIENT 2           0,       1                          0
2 POLYNOMIAL COEFFICIENT 3           0,       1                          1
2 POLYNOMIAL COEFFICIENT 4           0,       1                          1
2 POLYNOMIAL COEFFICIENT 5           0,       1                          0
2 POLYNOMIAL COEFFICIENT 6           0,       1                          1
2 POLYNOMIAL COEFFICIENT 7           0,       1                          1

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH ES58

Device Name       : ES58
Editor Name       : D0279
Creation Date     : 16 Mar 85
Date of Last Use  : 16 Mar 85
Current Uses      : 1
Descriptor        : 8-BIT-TO-SYMBOL CONV
zzzzPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DULOC:   0    0

Display User Parameters? (Y/N): N

zzzzPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MD143

Device Name       : MD143
Editor Name       : D0279
Creation Date     : 28 Mar 85
Date of Last Use  :  2 Apr 85
Current Uses      : 23
Descriptor        : 8-FSK SYMBOL INPUT
zzzzPRIV.DATA: RLPNT: -1
               PFLAG: 23
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PM,FM,PF,CU,FM,
                                PU                                          FS
 FREQUENCY, MHZ                       0.001 TO
                                100000.000                                 70.000
 ALPHABET SIZE                     2,     4,
                                   8,    16                                   8
 FREQUENCY SPACING,KHZ                0.001 TO
                                 9999.999                                  35.000
 INPUT SYMBOL TYPE              BI,SY                                       SY

zzzzPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
-I BD14
                                                        ****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

Device Name       : BD14
Editor Name       : D0279
Creation Date     : 22 Mar 85
Date of Last Use  : 18 Mar 85
Current Uses      : 3
Descriptor        : 8-FSK SOFT DECS.
****PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name              Option or Range    Default Value   Current Value
--------------              ---------------    -------------   -------------
 DEMODULATOR TYPE           BP,DP,QP,OQ,8P,
                            16,FS,MS,CP,AP,
                            PN,FH,PF                                FS
 FREQUENCY, MHZ                   0.001 TO
                             100000.000                           70.000
 ALPHABET SIZE                2,       4,
                              8,      16                               8
 FREQUENCY SPACING, KHZ           0.001 TO
                               9999.999                           35.000
 BANDWIDTH-TIMING LOCK LOOP,HZ    0.000 TO
                            1000000.000                            0.000
 DAMPING FACTOR-TIMING LOOP       0.010 TO
                                  9.990            0.707           0.707
 AGC-TIMING LOCK LOOP       YE,NO                                   NO
 LIMITATION AT ZERO DBW     YE,NO                                   YE
 DECISION TYPE              HA,SO                                   SO

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH YS83

Device Name       : YS83
Editor Name       : D0279
Creation Date     : 16 Mar 85
Date of Last Use  : 16 Mar 85
Current Uses      : 2
Descriptor        : 8-FSK SO. SYM-TO-BIT
****PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Decoder
Parameter Name              Option or Range    Default Value   Current Value
--------------              ---------------    -------------   -------------
 DECODER TYPE               DF,CN,BI,SI,SB                          SB
 INPUT SYMBOL TYPE          FS,FH,BP,16                             FS
 ALPHABET SIZE                2,       4,
                              8,      16                               8
 INPUT SYMBOL DECISIONS     HA,SO                                   SO
```

```
SH VU8

Device Name       : VU8
Editor Name       : D0279
Creation Date     : 22 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 4
Descriptor        : R - 1/2, LEN-7, UD, SOFT
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  4
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

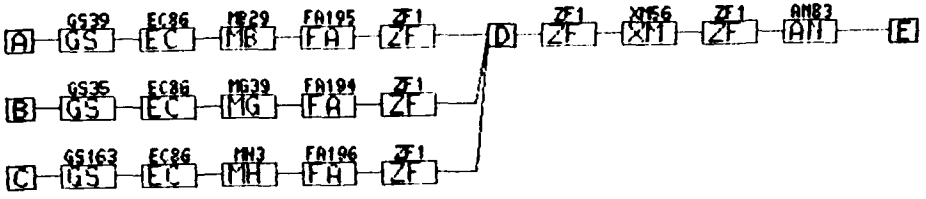
Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	UM,UD		UM
QUANT THRESH SPACING	0.100 TO 3.000		0.400
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999990E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999990E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999990E+37		1.000
-METRIC 2	0.000000E+00 TO 9.999990E+37		6.000
METRIC ASSIGNMENT 3			
-METRIC 1			

```
                                0.000000E+00 TO
                                9.999990E+37                    2.000
  -METRIC 2                     0.000000E+00 TO
                                9.999990E+37                    5.000
METRIC ASSIGNMENT 4
  -METRIC 1                     0.000000E+00 TO
                                9.999990E+37                    3.000
  -METRIC 2                     0.000000E+00 TO
                                9.999990E+37                    4.000
METRIC ASSIGNMENT 5
  -METRIC 1                     0.000000E+00 TO
                                9.999990E+37                    4.000
  -METRIC 2                     0.000000E+00 TO
                                9.999990E+37                    3.000
METRIC ASSIGNMENT 6
  -METRIC 1                     0.000000E+00 TO
                                9.999990E+37                    5.000
  -METRIC 2                     0.000000E+00 TO
                                9.999990E+37                    2.000
METRIC ASSIGNMENT 7
  -METRIC 1                     0.000000E+00 TO
                                9.999990E+37                    6.000
  -METRIC 2                     0.000000E+00 TO
                                9.999990E+37                    1.000
METRIC ASSIGNMENT 8
  -METRIC 1                     0.000000E+00 TO
                                9.999990E+37                    7.000
  -METRIC 2                     0.000000E+00 TO
                                9.999990E+37                    8.000

zzzzPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 8

TEST 7

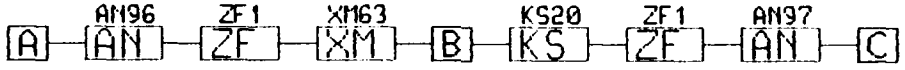
XT63



XT63 Generate Stored Samples

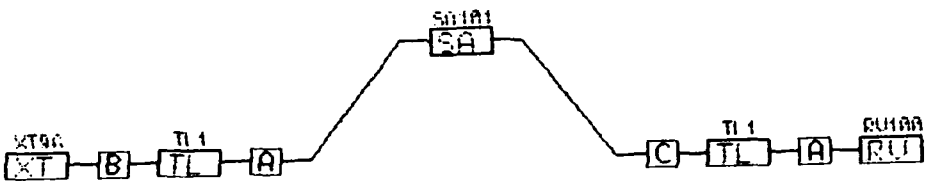
TEST 7/8 WITH KS

SA90



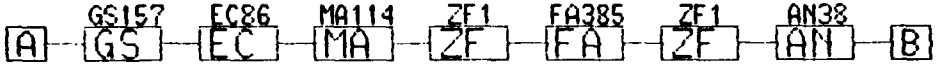
ACCEPTANCE TEST 8

SY30



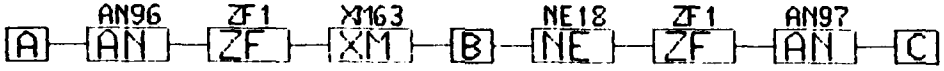
TEST MSK SOFT

XT96



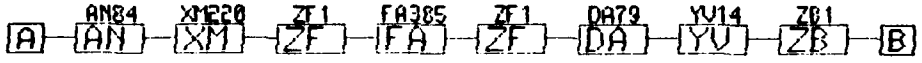
TEST8 PLAYBACK

SA101



RV FOR AT8

RV100



```
                                                        nter FSCSS Command:

Enter FSCSS Command: SH SV12

System Name                 : SV12
Editor Name                 : FSCSS2        ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 3
Creation Date               : 26 Apr 85                    BTPPTR: 624
Date of Last Run/Restart    : 26 Apr 85
# of Transmit Terminals     : 1
# of Receive Terminals      : 0             Linkage Specification    : QE
# of Satellites             : 1             TDMA 'Devices'           : (None)
# of Transmission Paths      : 1             Demand Access 'Devices'  : (None)

SV12 Descriptor: AT7 WITH KS.

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT63  SA90   EA   TL1

Display Associated Device Linkage? (Y/N): Y
No Associated Devices

ZZZZPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT63

Element Name          : XT63
Editor Name           : FSCSS2          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 6
Creation Date         : 20 Mar 85
Date of Last Use      : 26 Apr 85       Latitude  :   0 Deg   0 Min  N
Current Uses          : 6               Longitude :   0 Deg   0 Min  E
Number of Segments    : 4               Altitude  : 0.000 Kilometers

XT63 Descriptor: TEST 7

     Seg   Dev
  #  Code  Count  Devices
  1    AD      5  GS39-EC86-MB29-FA195-ZF1
  2    BD      5  GS35-EC86-MG39-FA194-ZF1
  3    CD      5  GS163-EC86-MH3-FA196-ZF1
  4    DE      4  ZF1-XM56-ZF1-AN83

Enter FSCSS Command: SH SA90

Element Name          : SA90
Editor Name           : FSCSS2          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 4
Creation Date         : 22 Mar 85
Date of Last Use      : 26 Apr 85       Latitude  :   0 Deg   0 Min  N
Current Uses          : 4               Longitude :   0 Deg   0 Min  E
Number of Segments    : 2               Altitude  : 35860.000 Kilometers

SA90 Descriptor: TEST 7/8 WITH KS

     Seg   Dev
  #  Code  Count  Devices
  1    AB      3  AN96-ZF1-XM63
  2    BC      3  KS20-ZF1-AN97
```

```
Enter Entity Name: GS39

Device Name       : GS39
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 6
Descriptor        : TEST DPSK
####PRIV.DATA: RLPNT: -1
                PFLAG:  6
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 ####PRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                             IG
 DATA RATE,KBPS                        0.001 TO
                                 1000000.000                       250.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH GS35

Device Name       : GS35
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST
####PRIV.DATA: RLPNT: -1
                PFLAG:  7
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 ####PRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                             IG
 DATA RATE,KBPS                        0.001 TO
                                 1000000.000                       250.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH GS163

Device Name       : GS163
Editor Name       : D@S22
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 9
Descriptor        : TEST PN/FM SOFT
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  9
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 $$$$PRIV.TEST: SOURCE TYPE       IG,EX,A0,A1                              IG
 DATA RATE,KBPS                          0.001 TO
                                 1000000.000                           250.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

```
SM EC86

Device Name       : EC86
Editor Name       : D0522
Creation Date     :  5 Mar 85
Date of Last Use  : 28 Mar 85
Current Users     : 27
Descriptor        : TEST VA
####PRIV.DATA: RLPNT: -1
                PFLAG: 27
                DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF,CN,BI,SI,BS		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH MB29

Device Name       : MB29
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 6
Descriptor        : TEST DP SOFT
****PRIV.DATA: RLPNT: -1
               PFLAG:  6
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                   Option or Range   Default Value  Current Value
--------------                   ---------------   -------------  -------------
 MODULATOR TYPE                  BP,QP,OQ,MS,DP,
                                 8P,16,AP,FS,CP,
                                 PN,FH,PF,CU,FM,
                                 PU                                    DP
 FREQUENCY, MHZ                        0.001 TO
                                   100000.000                      8040.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH MG39

Device Name       : MG39
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST SOFT DECISION ON FH
####PRIV.DATA: RLPNT: -1
                PFLAG:  7
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FH,PF,CU,FM,
                                PU                                          FH
 FREQUENCY, MHZ                       0.001 TO
                                100000.000                                7900.000
 HOPPING FREQ SPACING, MHZ            0.001 TO
                                   999.999                                   2.000
 POWER OF 2 FOR NO OF HOP FREQ        1 TO     20                              2
 FREQ HOPPING RATE, MHZ         1.000000E-06 TO
                                9.999900E+01                               1.000
 LENGTH FH-PR GENERATOR            10 TO     31          10                  10
 SEED FH-PR GENERATOR                   1 TO
                                2147483647                                10101
 MODIFY HOP ADDRESS             YE,NO                                       NO
 ALPHABET SIZE M-ARY FSK             2,      4,
                                     8,     16                                2
 FSK TONE SPACING, KHZ                0.001 TO
                                   9999.999                                500.000
 INPUT SYMBOL TYPE              BI,SY                                       SY

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH MM3

Device Name       : MM3
Editor Name       : D0922
Creation Date     : 26 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 9
Descriptor        : TEST SOFT DECISION
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  9
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,QP,OQ,MS,DP, 8P,16,AP,FS,CP, PN,FH,PF,CU,FM, PU		PF
FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
CHIP RATE, MHZ	0.001 TO 999.999		5.000
LENGTH IN-PHASE,GEN	10 TO 31		31
LENGTH QUAD GEN	10 TO 31		31
SEED IN-PHASE GEN	1 TO 2147483647		101010101
SEED QUAD GEN	1 TO 2147483647		101010101
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		5.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		2
FREQ HOPPING RATE, MHZ	1.000000E-06 TO 9.999900E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31	10	10
SEED FH-PR GENERATOR	1 TO 2147483647		1010101010
MODIFY HOP ADDRESS	YE,NO		NO

```
ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH FA194

Device Name       : FA194
Editor Name       : D0922
Creation Date     : 26 Apr 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST SOFT
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 FILTER TYPE                    CS,BU,BT,BE,LE,
                                PR,PZ,FS                                      BU
 CENTER FREQUENCY, MHZ                0.001 TO
                                100000.000                                7900.000
 3-DB BANDWIDTH, MHZ                  0.001 TO
                                   999.999                                  40.000
 NO. OF POLES                      1 TO     30                                 11

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH FA195

Device Name       : FA195
Editor Name       : D0922
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 7
Descriptor        : TEST DPSK
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  7
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 FILTER TYPE                    CS,BU,BT,BE,LE,
                                PR,PZ,FS                                      CS
 CENTER FREQUENCY, MHZ                0.001 TO
                                100000.000                                8040.000
 3-DB BANDWIDTH, MHZ                  0.001 TO
                                   999.999                                   4.000
 NO. OF POLES                      1 TO     30                                 30
 RIPPLE FACTOR, DB                    0.000 TO
                                      3.000                                  0.100

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

```
Enter FSCSS Command: SH FA196

Device Name       : FA196
Editor Name       : D0922
Creation Date     : 26 Apr 85
Date of Last Use  : 28 Mar 85
Current Uses      : 8
Descriptor        : TEST PH/FH SOFT
####PRIV.DATA: RLPNT: -1
                PFLAG:  8
                DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		BU
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		25.000
NO. OF POLES	1 TO 30		11

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH XM56

Device Name       : XM56
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 5
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG:  5
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 GAIN, DB                          -200.000 TO
                                    200.000                            48.110

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN83

Device Name       : AN83
Editor Name       : D0922
Creation Date     : 12 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 5
Descriptor        : AT
####PRIV.DATA: RLPNT: -1
               PFLAG:  5
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 APPLICATION                       SU,SD,EX,ER,SS                         EX
 ANTENNA TYPE                      AG,EC,NB,PN,SN,
                                   BN                                     AG
 ANTENNA GAIN, DB                  -99.900 TO
                                    99.900                             60.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH AM96

Device Name       : AM96
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : TEST 7,8
####PRIV.DATA: RLPNT: -1
                 PFLAG:  6
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SU
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA,SA,BA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		98.000

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM63

Device Name       : XM63
Editor Name       : D0922
Creation Date     : 22 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : TEST 7,8 SA
####PRIV.DATA: RLPNT: -1
                 PFLAG:  6
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		-6.300

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH KS20

Device Name       : KS20
Editor Name       : FSCSS2
Creation Date     : 22 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        : TEST 7 SAMPLES
%%%%PRIV.DATA: RLPNT: -1
                PFLAG:  1
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Keep Samples
Parameter Name                    Option or Range  Default Value  Current Value
--------------                    ---------------  -------------  -------------

 EXTERNAL KEEP SAMPLES FILENAME --
   CURRENT VALUE: TEST7

%%%%PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN97

Device Name       : AN97
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : TEST 7,8
%%%%PRIV.DATA: RLPNT: -1
                PFLAG:  6
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range  Default Value  Current Value
--------------                    ---------------  -------------  -------------
 APPLICATION                      SU,SD,EX,ER,SS                        SD
 ANTENNA TYPE                     AG,EC,NB,PN,SN,
                                  BN                                    AG

 ANTENNA GAIN, DB                      -99.900 TO                      90.000
                                        99.900

%%%%PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH SY30

System Name                : SY30
Editor Name                : FSCSS2        ####PRIV.DATA: RLPNT: -1    PFLAG: 7
Creation Date              : 22 Mar 85                    BTPPTR: 493
Date of Last Run/Restart   : 26 Apr 85
# of Transmit Terminals    : 1
# of Receive Terminals     : 1             Linkage Specification    : GE
# of Satellites            : 1             TDMA "Devices"           : (None)
# of Transmission Paths     : 2             Demand Access "Devices"  : (None)

SY30 Descriptor: ACCEPT TEST 8

     Xmit  Recv         Transmission
  #  Elem  Elem  Code   Path Devices
  1  XT96  SA101  BA    TL1
  2  SA101 RV100  CA    TL1

Display Associated Device Linkage? (Y/N): Y

      Orig  Device    Dest  Device
  #   Elem Position  Elem Position
  1   XT96   1AB1    RV100  1AB8
  2   XT96   1AB2    RV100  1AB7
  3   XT96   1AB3    RV100  1AB6

####PRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT90
Element Does Not Exist: XT90

Enter FSCSS Command: SH XT96

Element Name         : XT96
Editor Name          : FSCSS2          ####PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date        : 22 Mar 85
Date of Last Use     : 22 Mar 85       Latitude  :   0 Deg   0 Min  N
Current Uses         : 1               Longitude :   0 Deg   0 Min  E
Number of Segments   : 1               Altitude  : 0.000 Kilometers

XT96 Descriptor: TEST MSK SOFT

      Seg   Dev
  #  Code  Count  Devices
  1    AB      7  GS157-EC86-MA114-ZF1-FA385-ZF1-AM38

Enter FSCSS Command:
```

```
4 SA101

Element Name       : SA101
Editor Name        : FSCSS2                 ****PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date      : 22 Mar 85
Date of Last Use   : 22 Mar 85              Latitude  :   0 Deg   0 Min  N
Current Uses       : 1                      Longitude :   0 Deg   0 Min  E
Number of Segments : 2                      Altitude  : 35860.000 Kilometers

SA101 Descriptor: TEST8 PLAY BACK.

       Seg    Dev
   #  Code  Count   Devices
   1   AB      3    AN96-ZF1-XM63
   2   BC      3    NE18-ZF1-AN97

Enter FSCSS Command: SH RV100

Element Name       : RV100
Editor Name        : FSCSS2                 ****PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date      : 22 Mar 85
Date of Last Use   : 22 Mar 85              Latitude  :   0 Deg   0 Min  N
Current Uses       : 1                      Longitude :   0 Deg   0 Min  E
Number of Segments : 1                      Altitude  : 0.000 Kilometers

RV100 Descriptor: RV FOR AT8

       Seg    Dev
   #  Code  Count   Devices
   1   AB      8    AN84-XM220-ZF1-FA385-ZF1-DA79-YU14-ZB1

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH GS157

Device Name       : GS157
Editor Name       : FSCSS2
Creation Date     : 26 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 ####PRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                                    IG
 DATA RATE,KBPS                          0.001 TO
                                 1000000.000                                250.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA114

Device Name       : MA114
Editor Name       : FSCSS2
Creation Date     : 26 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FM,PF,CW,FM,
                                PU                                             MS
 FREQUENCY, MHZ                          0.001 TO
                                  100000.000                               7950.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH EC86

Device Name       : EC86
Editor Name       : D0922
Creation Date     :  5 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 27
Descriptor        : TEST VA
####PRIV.DATA: RLPNT: -1
                PFLAG: 27
                DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF,CN,BI,SI,BS		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH FA38S

Device Name       : FA38S
Editor Name       : FSCSS2
Creation Date     : 26 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 2
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 FILTER TYPE                    CS,BU,BT,BE,LE,
                                PR,PZ,FS                                       CS
 CENTER FREQUENCY, MHZ             0.001 TO
                                100000.000                                7950.000
 3-DB BANDWIDTH, MHZ               0.001 TO
                                   999.999                                   2.000
 NO. OF POLES                    1 TO     30                                    11
 RIPPLE FACTOR, DB                 0.000 TO
                                     3.000                                 0.100

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN38

Device Name       : AN38
Editor Name       : FSCSS2
Creation Date     : 22 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                                 EX
 ANTENNA TYPE                   AG,EC,MB,PM,SM,
                                BM                                             AG
 ANTENNA GAIN, DB                -99.900 TO
                                  99.900                                    90.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH AM96

Device Name       : AM96
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : TEST 7,8
####PRIV.DATA: RLPNT: -1
                 PFLAG:  6
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 APPLICATION                      SU,SD,EX,ER,SS                            SU
 ANTENNA TYPE                     AG,EC,NB,PN,SN,
                                  BN,PA,SA,BA                               AG
 ANTENNA GAIN, DB                      -99.900 TO
                                        99.900                            90.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM63

Device Name       : XM63
Editor Name       : D0922
Creation Date     : 22 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : TEST 7,8 SA
####PRIV.DATA: RLPNT: -1
                 PFLAG:  6
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 GAIN, DB                             -200.000 TO
                                       200.000                           -6.300

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH ME18

Device Name       : ME18
Editor Name       : FSCSS2
Creation Date     : 22 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 3
Descriptor        : TEST 8 PLAY SAMPS.
####PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Noise Source
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 TYPE OF NOISE                  TE,SA            TE             SA

 EXTERNAL SAMPLE SOURCE FILENAME --
   CURRENT VALUE: TEST7

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN97

Device Name       : AN97
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : TEST 7,8
####PRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                  SD
 ANTENNA TYPE                   AG,EC,NB,PN,SN,
                                BN                              AG

 ANTENNA GAIN, DB               -99.900 TO
                                 99.900                         90.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH AM84

Device Name       : AM84
Editor Name       : FSCSS2
Creation Date     : 22 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        : AT 8 MSK
####PRIV.DATA: RLPNT: -1
                 PFLAG:  1
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 APPLICATION                      SU,SD,EX,ER,SS                            ER
 ANTENNA TYPE                     AG,EC,NB,PN,SN,
                                  BN,PA                                     AG
 ANTENNA GAIN, DB                      -99.900 TO
                                        99.900                            90.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM220

Device Name       : XM220
Editor Name       : FSCSS2
Creation Date     : 26 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        : TEST 8 MSK
####PRIV.DATA: RLPNT: -1
                 PFLAG:  1
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 GAIN, DB                             -200.000 TO
                                       200.000                           20.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH FA385

Device Name       : FA385
Editor Name       : FSCSS2
Creation Date     : 26 Mar 85
Date of Last Use  : 22 Mar 85
Current Users     : 2
Descriptor        :
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 FILTER TYPE                    CS,BU,BT,BE,LE,
                                PR,PZ,FS                                       CS
 CENTER FREQUENCY, MHZ             0.001 TO
                              100000.000                                  7950.000
 3-DB BANDWIDTH, MHZ               0.001 TO
                                 999.999                                     2.000
 NO. OF POLES                    1 TO     30                                    11
 RIPPLE FACTOR, DB                 0.000 TO
                                   3.000                                     0.100

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH
```

```
Enter Entity Name: DA79

Device Name       : DA79
Editor Name       : FSCSS2
Creation Date     : 26 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 1
Descriptor        : TEST 8 MSK SOFT
####PRIV.DATA: RLPNT: -1
                PFLAG:  1
                DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,QP,OQ,8P, 16,FS,MS,CP,AP, PN,FH,PF		MS
FREQUENCY, MHZ	0.001 TO 100000.000		7950.000
TYPE-TIMING LOCK LOOP	DF,PW		DF
BANDWIDTH-TIMING LOCK LOOP,HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
TYPE-PHASE LOCK LOOP	DF,PW		DF
ORDER-PHASE LOCK LOOP	2 ,3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING & PHASE LOCK LOOPS	YE,PL,NO		NO
LIMITATION AT ZERO DBW	YE,NO		NO
MINIMUM SIGNAL LEVEL, DBW	-200.000 TO 0.000		-10.000
DECISION TYPE	HA,SO		SO
DETECTOR TYPE	ID,FS		ID

```
####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH VU14

Device Name       : VU14
Editor Name       : D0922
Creation Date     : 12 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 22
Descriptor        : TEST VA HARD
####PRIV.DATA: RLPNT: -1
                 PFLAG: 22
                 DULOC:   0    0

Display User Parameters? (Y/N): Y
```

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	VM,VD		VM
QUANT THRESH SPACING	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999990E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999990E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999990E+37		1.000
-METRIC 2			

```
                                0.000000E+00 TO
                                9.999990E+37                    6.000
METRIC ASSIGNMENT 3
 -METRIC 1                      0.000000E+00 TO
                                9.999990E+37                    2.000
 -METRIC 2                      0.000000E+00 TO
                                9.999990E+37                    5.000
METRIC ASSIGNMENT 4
 -METRIC 1                      0.000000E+00 TO
                                9.999990E+37                    3.000
 -METRIC 2                      0.000000E+00 TO
                                9.999990E+37                    4.000
METRIC ASSIGNMENT 5
 -METRIC 1                      0.000000E+00 TO
                                9.999990E+37                    4.000
 -METRIC 2                      0.000000E+00 TO
                                9.999990E+37                    3.000
METRIC ASSIGNMENT 6
 -METRIC 1                      0.000000E+00 TO
                                9.999990E+37                    5.000
 -METRIC 2                      0.000000E+00 TO
                                9.999990E+37                    2.000
METRIC ASSIGNMENT 7
 -METRIC 1                      0.000000E+00 TO
                                9.999990E+37                    6.000
 -METRIC 2                      0.000000E+00 TO
                                9.999990E+37                    1.000
METRIC ASSIGNMENT 8
 -METRIC 1                      0.000000E+00 TO
                                9.999990E+37                    7.000
 -METRIC 2                      0.000000E+00 TO
                                9.999990E+37                    0.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

ACCEPTANCE TEST 9

PHASE NOISE ACCEPTANCE TEST

XT34

```
Enter FSCSS Command: SH SY26

System Name                : SY26
Editor Name                : FSCSS2        zzzzPRIV.DATA: RLPNT: -1    PFLAG: 15
Creation Date              : 18 Mar 85                    BTPPTR: 437
Date of Last Run/Restart   :  1 Apr 85
# of Transmit Terminals    : 1
# of Receive Terminals     : 0             Linkage Specification    : BT
# of Satellites            : 0             TDMA "Devices"           : (None)
# of Transmission Paths     : 1             Demand Access "Devices"  : (None)

SY26 Descriptor: TEST OSC. PHASE NOISE

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT34    0    B1   (None)

Display Associated Device Linkage? (Y/N): Y

      Orig  Device   Dest  Device
  #   Elem Position  Elem Position
  1   XT34   1AB1    XT34   1AB7
  2   XT34   1AB2    XT34   1AB6

zzzzPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT34

Element Name         : XT34
Editor Name          : FSCSS2              zzzzPRIV.DATA: RLPNT: -1    PFLAG: 2
Creation Date        : 18 Mar 85
Date of Last Use     : 26 Mar 85           Latitude  :   0 Deg   0 Min  N
Current Uses         : 2                   Longitude :   0 Deg   0 Min  E
Number of Segments   : 1                   Altitude  : 0.000 Kilometers

XT34 Descriptor: PHASE NOISE ACCPT TEST

      Seg   Dev
  #  Code  Count  Devices
  1    AB      7  GS178-MA112-QF21-NSB1-ZF1-DA149-ZB1

Enter FSCSS Command: Y
Unrecognized Command

Enter FSCSS Command: N
Unrecognized Command

Enter FSCSS Command:
```

```
MA112

Device Name        : MA112
Editor Name        : FSCSS2
Creation Date      : 18 Mar 85
Date of Last Use   : 18 Mar 85
Current Uses       : 1
Descriptor         : TEST PHASE NOISE
****PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DULOC:   0     0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                       Option or Range  Default Value  Current Value
--------------                      ---------------  -------------  -------------
 MODULATOR TYPE                      BP,QP,OQ,MS,DP,
                                     8P,16,AP,FS,CP,
                                     PN,FH,PF,CW,FM,
                                     PU                                   BP
 FREQUENCY, MHZ                          0.001 TO
                                      100000.000                        70.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH OF21

Device Name       : OF21
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  : 18 Mar 85
Current Users     : 1
Descriptor        : TEST PHASE NOISE 50 POIN
###PRIV.DATA: RLPNT: -1
              PFLAG:  1
              DVLOC:   0    0

Display User Parameters? (Y/N): Y

Frequency Translator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 TRANSLATION FREQUENCY, MHZ     -1000000.000 TO                                0.000
                                 1000000.000
 OSCILLATOR NOISE MODEL         YE,NO                                        YE
 POWER LAW PHASE NOISE MODEL    YE,NO                                        YE
 FREQUENCY SEPARATION, HZ              1.000 TO
                                 1000000.000                                2.000
 POWER SERIES COEF H0, RAD/Hz          0.000 TO
                                       1.000                  1.260000E-10
 POWER SERIES COEF H2, RAD#Hz          0.000 TO
                                       1.000                        0.010
 POWER SERIE COEF H3,RAD#Hz#Hz         0.000 TO
                                       1.000                        0.200

###PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH QF21

Device Name       : QF21
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  : 18 Mar 85
Current Uses      : 1
Descriptor        : TEST PHASE NOISE 50 POIN
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Frequency Translator
Parameter Name                    Option or Range          Default Value  Current Value
--------------                    ---------------          -------------  -------------
 TRANSLATION FREQUENCY, MHZ       -1000000.000 TO                                0.000
                                   1000000.000
 OSCILLATOR NOISE MODEL           YE,NO                                        YE
 POWER LAW PHASE NOISE MODEL      YE,NO                                        YE
 FREQUENCY SEPARATION, HZ                1.000 TO
                                   1000000.000                                  2.000
 POWER SERIES COEF H0, RAD/Hz            0.000 TO
                                         1.000                        1.260000E-10
 POWER SERIES COEF H2, RAD$Hz            0.000 TO
                                         1.000                                0.010
 POWER SERIE COEF H3,RAD$Hz$Hz           0.000 TO
                                         1.000                                0.200

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH NS81

Device Name       : NS81
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  : 18 Mar 85
Current Uses      : 1
Descriptor        : 1.79E20
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Noise Source
Parameter Name                    Option or Range          Default Value  Current Value
--------------                    ---------------          -------------  -------------
 TYPE OF NOISE                    TE,SA                          TE             TE
 EFFECTIVE NOISE TEMP,K           0.000000E+00 TO
                                  1.000000E+23                                 0.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
DA149

Device Name       : DA149
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  : 18 Mar 85
Current Uses      : 1
Descriptor        : TEST PHASE NOISE.
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

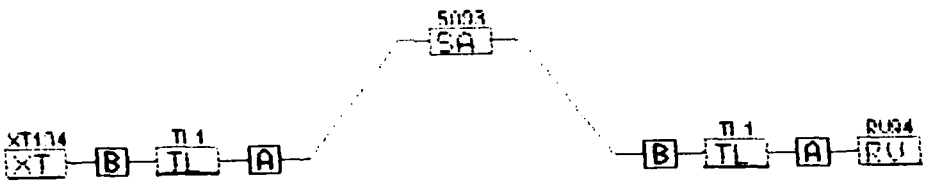
Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,QP,OQ,8P, 16,FS,MS,CP,AP, PN,FH,PF		BP
FREQUENCY, MHZ	0.001 TO 100000.000		70.000
TYPE-TIMING LOCK LOOP	DF,PW		DF
BANDWIDTH-TIMING LOCK LOOP,HZ	0.000 TO 1000000.000		0.100
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
TYPE-PHASE LOCK LOOP	DF,PW		DF
ORDER-PHASE LOCK LOOP	2 ,3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		5.446
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING & PHASE LOCK LOOPS	YE,PL,NO		NO
LIMITATION AT ZERO DBW	YE,NO		NO
MINIMUM SIGNAL LEVEL, DBW	-200.000 TO 0.000		0.000
DECISION TYPE	HA,SO		HA
DETECTOR TYPE	ID,FS		ID

```
ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N
```

ACCEPTANCE TEST 10

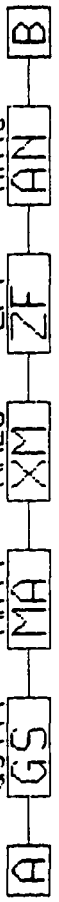
REMOD TEST WITH DIFFERENTIAL ENCODER

SY89



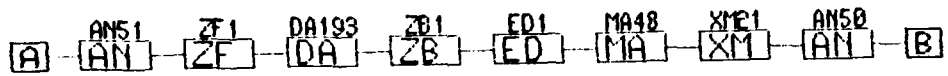
TEST 10

XT134



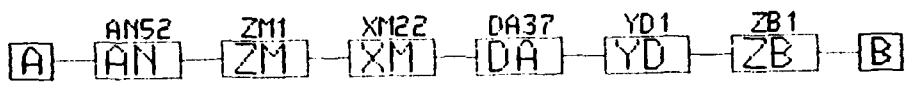
TEST 10 SATELLITE W/DE

SA93



TEST REMOD WITH DIFFERENTIAL DECODER

RV94



```
SH SY89

System Name                : SY89
Editor Name                : FSCSS2        ####PRIV.DATA: RLPNT: -1    PFLAG: 2
Creation Date              : 22 Mar 85                    BTPPTR: 488
Date of Last Run/Restart   : 22 Mar 85
# of Transmit Terminals    : 1
# of Receive Terminals     : 1             Linkage Specification    : GE
# of Satellites            : 1             TDMA "Devices"           : (None)
# of Transmission Paths     : 2             Demand Access "Devices"  : (None)

SY89 Descriptor: remod test w/diff enc

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT134 SA93   BA   TL1
  2  SA93  RV94   BA   TL1

Display Associated Device Linkage? (Y/N): Y

      Orig  Device   Dest  Device
  #   Elem Position  Elem Position
  1   XT134  1AB1    SA93   1AB4
  2   XT134  1AB2    SA93   1AB3
  3   SA93   1AB4    RV94   1AB6
  4   SA93   1AB6    RV94   1AB4
  5   SA93   1AB5    RV94   1AB5

####PRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT134

Element Name       : XT134
Editor Name        : D0922             ####PRIV.DATA: RLPNT: -1    PFLAG: 3
Creation Date      :  6 Mar 85
Date of Last Use   : 22 Mar 85         Latitude  :   0 Deg   0 Min  N
Current Uses       : 3                 Longitude :   0 Deg   0 Min  E
Number of Segments : 1                 Altitude  : 0.000 Kilometers

XT134 Descriptor: TEST 10

     Seg   Dev
  #  Code  Count  Devices
  1    AB      5  GS177-MA44-XM20-ZF1-AN49

Enter FSCSS Command:
```

```
4 SA93

Element Name        : SA93
Editor Name         : FSCSS2                ****PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 22 Mar 85
Date of Last Use    : 22 Mar 85             Latitude  :   1 Deg   0 Min  N
Current Uses        : 1                     Longitude :   0 Deg   2 Min  E
Number of Segments  : 1                     Altitude  : 35860.000 Kilometers

SA93 Descriptor: test 10 satellite w/de

      Seg   Dev
  #  Code  Count  Devices
  1    AB      8  AN51-ZF1-DA193-ZB1-ED1-MA48-XM21-AN50

Enter FSCSS Command: SH RV94

Element Name        : RV94
Editor Name         : FSCSS2                ****PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 22 Mar 85
Date of Last Use    : 22 Mar 85             Latitude  :   2 Deg   0 Min  N
Current Uses        : 1                     Longitude :   3 Deg   0 Min  E
Number of Segments  : 1                     Altitude  : 0.000 Kilometers

RV94 Descriptor: test remod w/diff dec

      Seg   Dev
  #  Code  Count  Devices
  1    AB      6  AN52-ZM1-XM22-DA37-YD1-ZB1

Enter FSCSS Command:
```

```
.GS177

Device Name       : GS177
Editor Name       : D0922
Creation Date     :  6 Mar 85
Date of Last Use  : 20 Mar 85
Current Uses      : 4
Descriptor        : TEST 10
####PRIV.DATA: RLPNT: -1
                 PFLAG:  4
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 ####PRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                         IG
 DATA RATE,KBPS                          0.001 TO
                                 1000000.000                       1000.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA44

Device Name       : MA44
Editor Name       : D0922
Creation Date     :  6 Mar 85
Date of Last Use  : 20 Mar 85
Current Uses      : 4
Descriptor        : TEST 10]
####PRIV.DATA: RLPNT: -1
                 PFLAG:  4
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FH,PF,CU,FM,
                                PU                                  QP
 FREQUENCY, MHZ                          0.001 TO
                                 100000.000                        8000.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
XM20

Device Name       : XM20
Editor Name       : D0922
Creation Date     :  8 Mar 85
Date of Last Use  :  6 Mar 85
Current Uses      : 1
Descriptor        : TEST 10
xxxxPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range   Default Value  Current Value
--------------                    ---------------   -------------  -------------
 GAIN, DB                          -200.000 TO
                                    200.000                            100.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN49

Device Name       : AN49
Editor Name       : D0922
Creation Date     :  6 Mar 85
Date of Last Use  :  6 Mar 85
Current Uses      : 1
Descriptor        : TEST 10
xxxxPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range   Default Value  Current Value
--------------                    ---------------   -------------  -------------
 APPLICATION                      SU,SD,EX,ER,SS                          EX
 ANTENNA TYPE                     AG,EC,NB,PM,SN,
                                  BN                                      NB
 BEAMWIDTH 3-DB, DEG                 0.010 TO
                                    70.000                              5.000
 ANTENNA POINTING SPEC            AE,PE                                  PE
 POINTING ERROR, DEG                 0.000 TO
                                    10.000          0.000               0.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH AN51

Device Name       : AN51
Editor Name       : D0922
Creation Date     :  6 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 3
Descriptor        : TEST 10
xxxxPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                 Option or Range      Default Value  Current Value
--------------                 ---------------      -------------  -------------
 APPLICATION                   SU,SD,EX,ER,SS                            SU
 ANTENNA TYPE                  AG,EC,NB,PN,SN,
                               BN,PA,SA,BA                               AG
 ANTENNA GAIN, DB                   -99.900 TO
                                     99.900                            60.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
-| DA193

Device Name      : DA193
Editor Name      : D0922
Creation Date    :  8 Mar 85
Date of Last Use : 22 Mar 85
Current Uses     : 5
Descriptor       : TEST 10
****PRIV.DATA: RLPNT: -1
               PFLAG:  5
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name                      Option or Range  Default Value  Current Value
--------------                      ---------------  -------------  -------------
 DEMODULATOR TYPE                   BP,DP,QP,OQ,8P,
                                    16,FS,MS,CP,AP,
                                    PN,FH,PF                              QP
 FREQUENCY, MHZ                           0.001 TO
                                     100000.000                        8000.000
 TYPE-TIMING LOCK LOOP              DF,PU                                 DF
 BANDWIDTH-TIMING LOCK LOOP,HZ            0.000 TO
                                    1000000.000                           0.100
 DAMPING FACTOR-TIMING LOOP               0.010 TO
                                          9.990            0.707          0.707
 TYPE-PHASE LOCK LOOP               DF,PW                                 DF
 ORDER-PHASE LOCK LOOP              2 ,3                                  2
 BANDWIDTH-PHASE LOCK LOOP, HZ            0.000 TO
                                    1000000.000                           1.000
 DAMPING FACTOR-PHASE LOOP                0.010 TO
                                          9.990            0.707          0.707
 AGC-TIMING & PHASE LOCK LOOPS      YE,PL,NO                              NO
 LIMITATION AT ZERO DBW             YE,NO                                 NO
 MINIMUM SIGNAL LEVEL, DBW             -200.000 TO
                                          0.000                         -13.340
 DECISION TYPE                      HA,SO                                 HA
 DETECTOR TYPE                      ID,FS                                 ID

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
ED1

Device Name       : ED1
Editor Name       : FSCSS
Creation Date     : 14 Dec 84
Date of Last Use  : 26 Mar 85
Current Uses      : 6
Descriptor        : Permanent DIFF ENCODER
####PRIV.DATA: RLPNT: -1
                 PFLAG:  6
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name                  Option or Range   Default Value  Current Value
--------------                  ---------------   -------------  -------------
 ENCODER TYPE                   DF,CN,BI,SI,BS                         DF

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA48

Device Name       : MA48
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 4
Descriptor        : TEST10
####PRIV.DATA: RLPNT: -1
                 PFLAG:  4
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range   Default Value  Current Value
--------------                  ---------------   -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PM,FM,PF,CU,FM,
                                PU                                      OQ
 FREQUENCY, MHZ                       0.001 TO                  2000.000
                                100000.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH XM21

Device Name       : XM21
Editor Name       : D0922
Creation Date     :  8 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 3
Descriptor        : TEST10
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 GAIN, DB                          -200.000 TO
                                    200.000                              78.960

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN50

Device Name       : AN50
Editor Name       : D0922
Creation Date     :  6 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 3
Descriptor        : TEST 10
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 APPLICATION                       SU,SD,EX,ER,SS                          SD
 ANTENNA TYPE                      AG,EC,NB,PN,SN,
                                   BN                                      AG
 ANTENNA GAIN, DB                  -99.900 TO
                                    99.900                               60.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
-AN52

Device Name       : AN52
Editor Name       : D0922
Creation Date     :  8 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 2
Descriptor        : TEST REMOD
****PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range   Default Value   Current Value
--------------                    ---------------   -------------   -------------
 APPLICATION                      SU,SD,EX,ER,SS                         ER
 ANTENNA TYPE                     AG,EC,NB,PN,SM,
                                  BN,PA                                  NB
 BEAMWIDTH 3-DB, DEG                 0.010 TO
                                    70.000                                 0.100
 ANTENNA POINTING SPEC            AE,PE                                  PE
 POINTING ERROR, DEG                 0.000 TO
                                    10.000             0.000             0.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
XM22

Device Name      : XM22
Editor Name      : D0922
Creation Date    :  8 Mar 85
Date of Last Use : 22 Mar 85
Current Uses     : 2
Descriptor       : TEST REMOD
****PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                        Option or Range  Default Value  Current Value
--------------                        ---------------  -------------  -------------
 GAIN, DB                             -200.000 TO
                                       200.000                                0.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

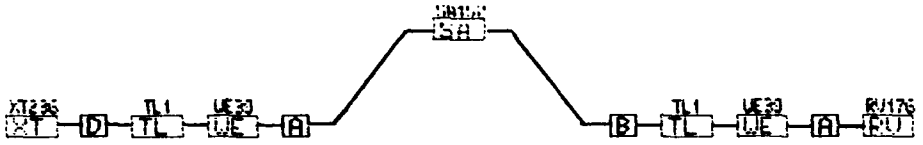
```
SH DA37

Device Name       : DA37
Editor Name       : D0922
Creation Date     : 14 Mar 85
Date of Last Use  : 22 Mar 85
Current Uses      : 3
Descriptor        : TEST REMOD
****PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name                   Option or Range  Default Value  Current Value
--------------                   ---------------  -------------  -------------
 DEMODULATOR TYPE                BP,DP,QP,OQ,8P,
                                 16,FS,MS,CP,AP,
                                 PN,FH,PF                             OQ
 FREQUENCY, MHZ                        0.001 TO
                                  100000.000                      8000.000
 TYPE-TIMING LOCK LOOP           DF,PW                               DF
 BANDWIDTH-TIMING LOCK LOOP,HZ         0.000 TO
                                 1000000.000                         0.100
 DAMPING FACTOR-TIMING LOOP            0.010 TO
                                       9.990           0.707         0.707
 TYPE-PHASE LOCK LOOP            DF,PW                               DF
 ORDER-PHASE LOCK LOOP           2 ,3                                2
 BANDWIDTH-PHASE LOCK LOOP, HZ         0.000 TO
                                 1000000.000                         1.000
 DAMPING FACTOR-PHASE LOOP             0.010 TO
                                       9.990           0.707         0.707
 AGC-TIMING & PHASE LOCK LOOPS   YE,PL,NO                            NO
 LIMITATION AT ZERO DBW          YE,NO                               NO
 MINIMUM SIGNAL LEVEL, DBW          -200.000 TO
                                       0.000                         0.000
 DECISION TYPE                   HA,SO                               HA
 DETECTOR TYPE                   ID,FS                               ID

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH YD1

Device Name       : YD1
Editor Name       : FSCSS
Creation Date     : 13 Sep 83
Date of Last Use  :  2 Apr 85
Current Uses      : 6
Descriptor        : Permanent DIFF DECODER
****PRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Decoder
Parameter Name                   Option or Range  Default Value  Current Value
--------------                   ---------------  -------------  -------------
 DECODER TYPE                                                        DF,CN,BI,SI,SB
                                                                     DF

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

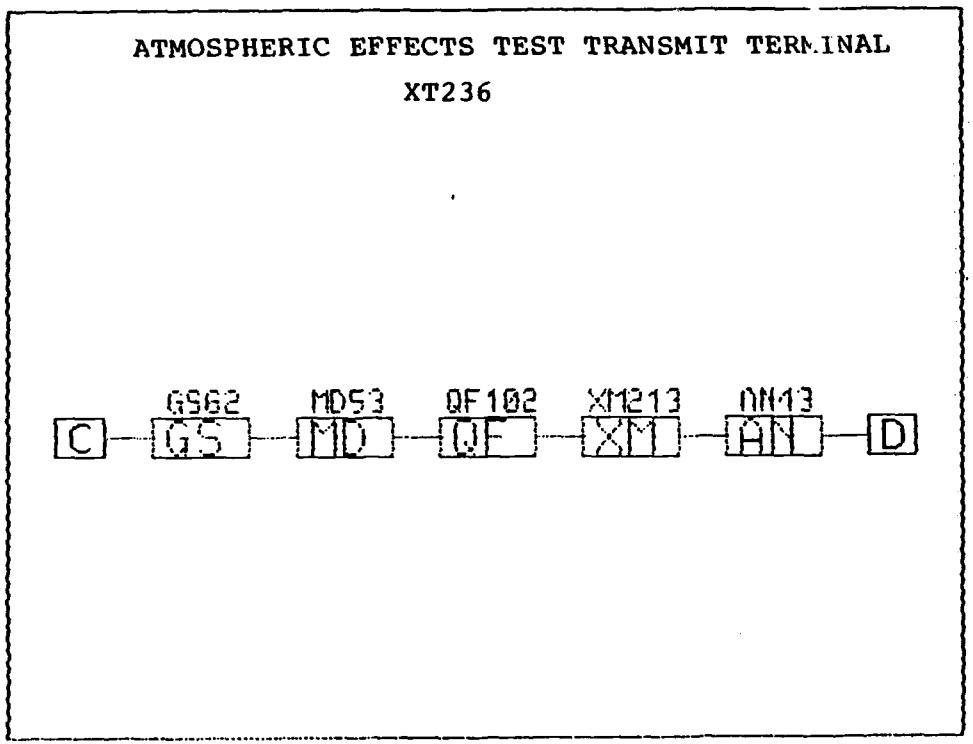
```
-YD1

Device Name       : YD1
Editor Name       : FSCSS
Creation Date     : 13 Sep 83
Date of Last Use  :  2 Apr 85
Current Uses      : 6
Descriptor        : Permanent DIFF DECODER
xxxxPRIV.DATA: RLPNT: -1
               PFLAG:  6
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Decoder
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 DECODER TYPE                   DF,CN,BI,SI,SB                        DF

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

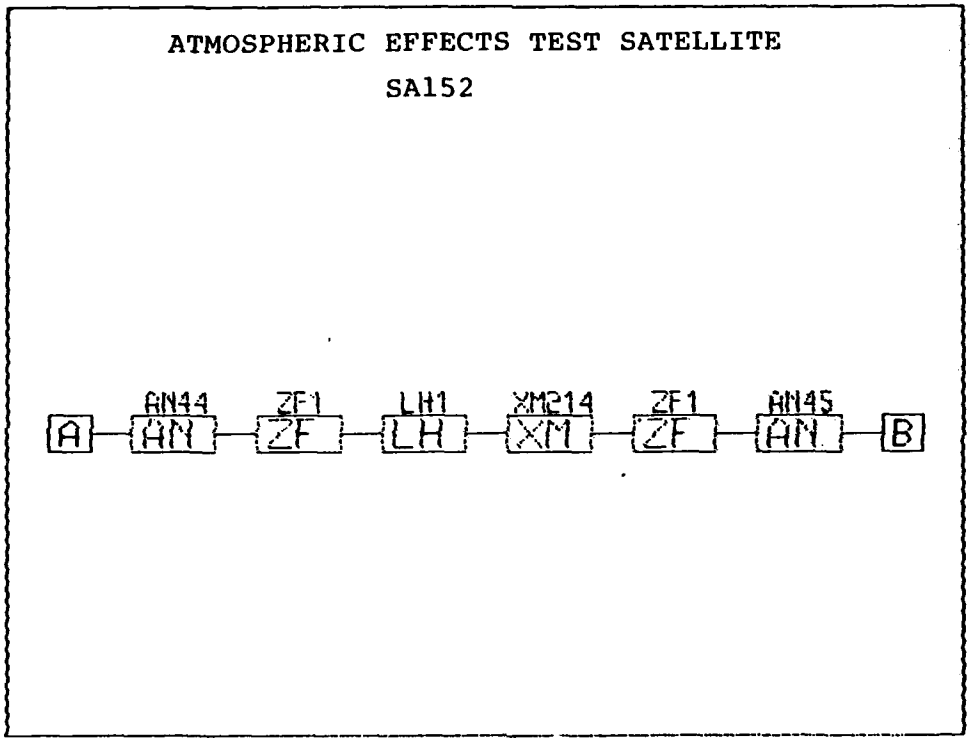
ACCEPTANCE TEST 11

ATMOSPHERIC EFFECTS WITH UP- AND DOWNLINK

SY53

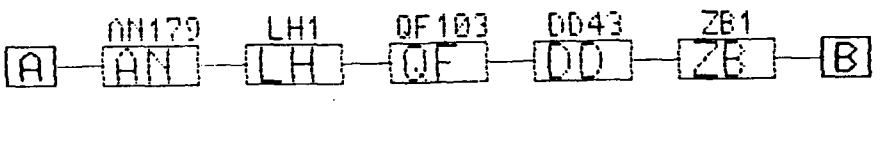



ATMOSPHERIC EFFECTS TEST TRANSMIT TERMINAL
XT236
GS62
MD53
QF102
XM213
AN13
C
GS
MD
QF
XM
AN
D

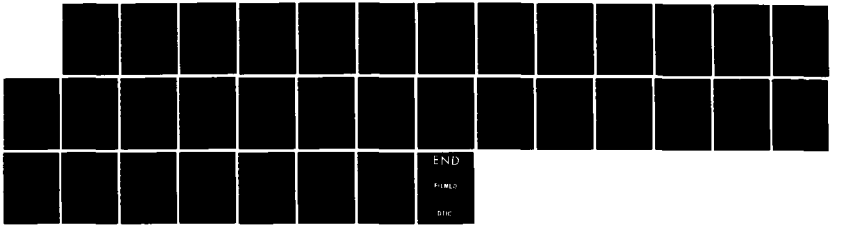

ATMOSPHERIC EFFECTS TEST SATELLITE
SA152
A
AN44
AN
ZF1
ZF
LH1
LH
XM214
XM
ZF1
ZF
AN45
AN
B

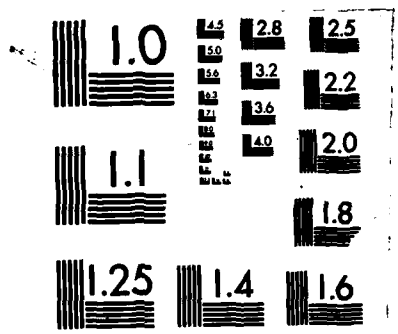
ATMOSPHERIC EFFECTS TEST RECEIVE TERMINAL

RV176



AD-A155 647 FLEXIBLE SATELLITE COMMUNICATIONS SYSTEMS SIMULATOR(U) 3/3
COMPUTER SCIENCES CORP FALLS CHURCH VA SYSTEMS DIV
D F ARNAUD ET AL. 16 MAY 85 DCA100-77-C-0020
UNCLASSIFIED F/G 17/2 NL





```
Enter FSCSS Command: sh ue39

Device Name       : UE39
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 3
Descriptor        : AE LINEAR, VERTICAL, 30
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DULOC:   0    0

Display User Parameters? (Y/N): y

Atmospheric Effects
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 ATMOSPHERIC ABSORPTION         YE,NO                                       YE
 WATER VAPOR DENSITY, G/CU.M    0.000 TO 15.000              7.500          7.510
 CLOUD ATTENUATION              YE,NO                                       YE
 CLOUD WATER VAPOR DENS,G/CU.M  0.000 TO 99.900              0.300         15.000
 CLOUD THICKNESS, KM            0.000 TO 99.900              1.000         10.000
 CLOUD TEMP, K                  200.000 TO 400.000         273.000        300.000
 RAIN ATTENUATION               YE,NO                                       YE
 RAINFALL ZONE                  A ,B ,C ,D1,D2,
                                D3,E ,F ,G ,H                               D3
 TIME AVAILABILITY ((=0.99999)  0.980 TO 1.000                              1.000
 0 DEG ISOTHERM HEIGTH, KM      0.000 TO 5.000                              4.000
 SPATIAL DIVERSITY              YE,NO                                       NO
 CROSS POLARIZATION             YE,NO                                       YE
 POLARIZATION TYPE              CI,LI                                       LI
 RAIN DROP AXIS ORIENTATN, DEG  0.000 TO 90.000             30.000         30.000
 S.D. OF MEAN OF ORIENTAT, DEG  0.000 TO 90.000              3.000          3.000
 POLARIZATION TILT ANGLE, DEG   0.000 TO 45.000                             30.000
 POLARIZATION DIRECTION         HO,VE                                       VE
ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:
```

```
SH XT236

Element Name          : XT236
Editor Name           : D0279                    ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 2
Creation Date         : 18 Dec 84
Date of Last Use      :  1 Apr 85                Latitude  :  40 Deg   0 Min  N
Current Uses          : 2                        Longitude : 120 Deg   0 Min  E
Number of Segments    : 1                        Altitude  : 0.000 Kilometers

XT236 Descriptor: AE TEST TERM

      Seg    Dev
  #  Code  Count  Devices
  1    CD      5  GS62-MD53-QF102-XM213-AN43

Enter FSCSS Command: SH GS62

Device Name           : GS62
Editor Name           : D0917
Creation Date         : 14 Dec 84
Date of Last Use      : 28 Mar 85
Current Uses          : 0
Descriptor            : 9.6 KBPS SOURCE
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  0
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 ZZZZPRIV.TEST: SOURCE TYPE       IG,EX,A0,A1                                 IG
 DATA RATE,KBPS                     0.001 TO
                                 1000000.000                              9.600

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

```
SH MD53

Device Name       : MD53
Editor Name       : D0917
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 0
Descriptor        : 8-FSK, 36.11 KHZ, 1 GHZ
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  0
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range   Default Value  Current Value
--------------                  ---------------   -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                SP,16,AP,FS,CP,
                                PM,FH,PF,CW,FM,
                                PU                                        FS
 FREQUENCY, MHZ                       0.001 TO
                                 100000.000                        1000.000
 ALPHABET SIZE                        2,     4,
                                      8,    16                           8
 FREQUENCY SPACING,KHZ                0.001 TO
                                  9999.999                          36.110
 INPUT SYMBOL TYPE              BI,SY                                BI

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): NO

Enter FSCSS Command: SH QF102

Device Name       : QF102
Editor Name       : D0917
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 0
Descriptor        : AE TEST 9 GHZ FT
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  0
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Frequency Translator
Parameter Name                  Option or Range   Default Value  Current Value
--------------                  ---------------   -------------  -------------
 TRANSLATION FREQUENCY, MHZ     -1000000.000 TO
                                 1000000.000                       9000.000
 OSCILLATOR NOISE MODEL         YE,NO                                NO

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH XM213

Device Name       : XM213
Editor Name       : D0279
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 2
Descriptor        : XMIT AMP 100DB
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 GAIN, DB                          -200.000 TO
                                    200.000                            100.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN43

Device Name       : AN43
Editor Name       : D0279
Creation Date     :  8 Nov 84
Date of Last Use  : 28 Mar 85
Current Uses      : 2
Descriptor        : ET XMIT ANT GAIN = 45.5
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 APPLICATION                       SU,SD,EX,ER,SS                          EX
 ANTENNA TYPE                      AG,EC,NB,PN,SN,
                                   BN                                      AG
 ANTENNA GAIN, DB                  -99.900 TO
                                    99.900                              45.500

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

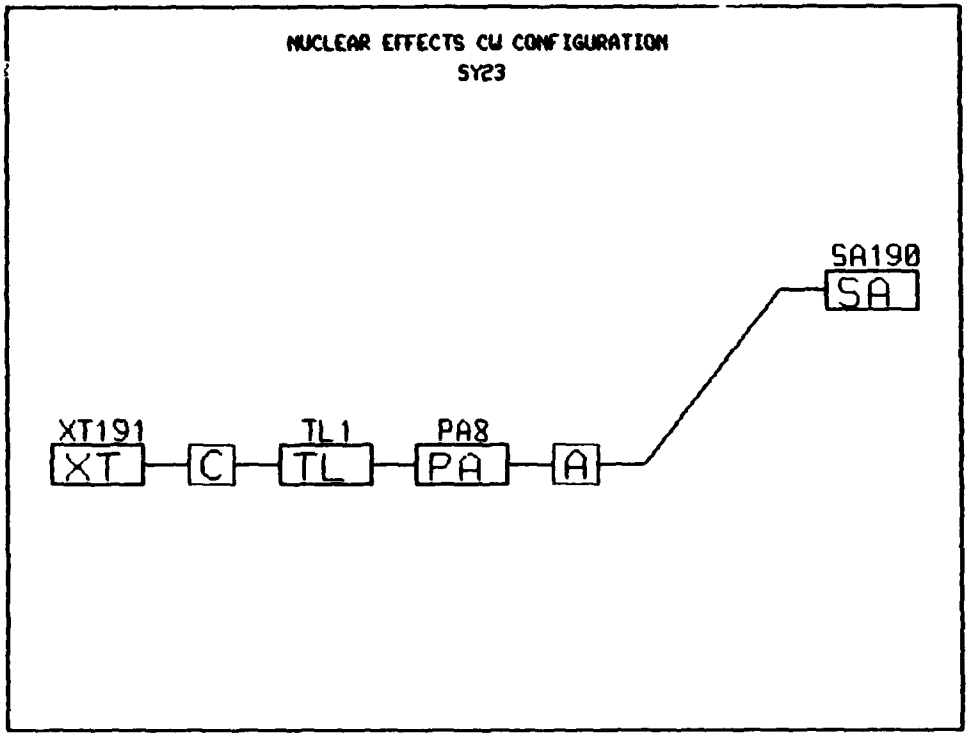
```
SH SA152

Element Name        : SA152
Editor Name         : FSCSS2                ####PRIV.DATA: RLPNT: -1    PFLAG: 2
Creation Date       : 28 Mar 85
Date of Last Use    :  1 Apr 85             Latitude  :   0 Deg   0 Min  N
Current Uses        : 2                     Longitude :  60 Deg   0 Min  E
Number of Segments  : 1                     Altitude  : 35860.000 Kilometers

SA152 Descriptor: AE TEST SATELLITE

     Seg   Dev
  #  Code  Count  Devices
  1    AB      6  AN44-ZF1-LH1-XM214-ZF1-AN45

Enter FSCSS Command: SH AN44

Device Name       : AN44
Editor Name       : D0279
Creation Date     :  8 Nov 84
Date of Last Use  : 28 Mar 85
Current Uses      : 2
Descriptor        : SU ANT GAIN = 23.5
####PRIV.DATA: RLPNT: -1
                PFLAG:  2
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                                  SU
 ANTENNA TYPE                   AG,EC,NB,PN,SN,
                                BN,PA,SA,BA                                     AG
 ANTENNA GAIN, DB                    -99.900 TO
                                      99.900                                  23.500

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

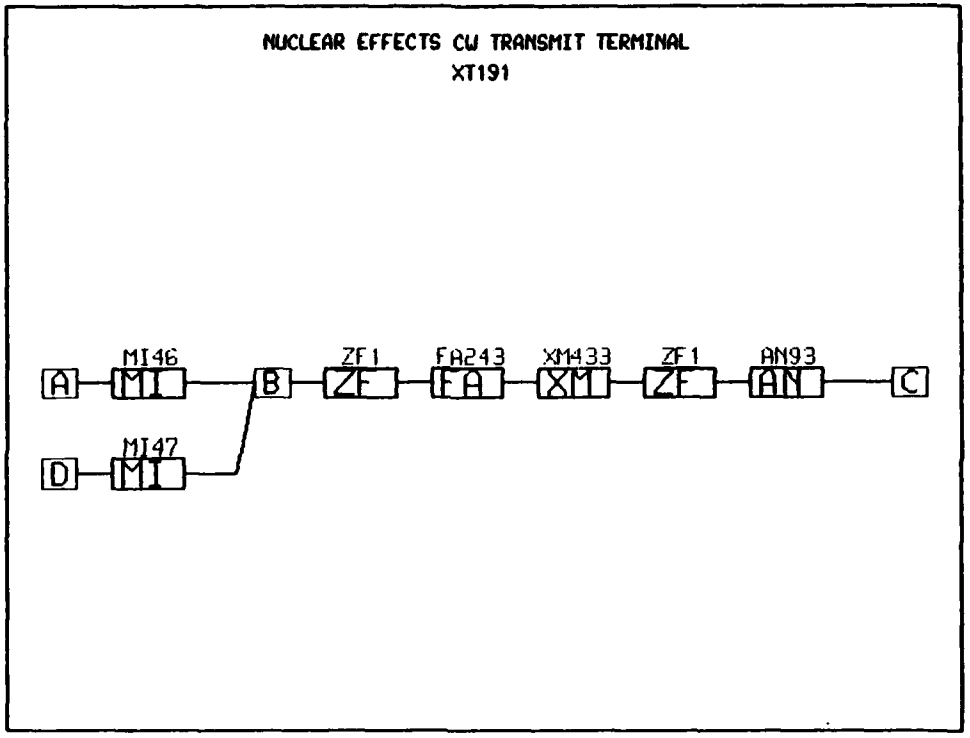
```
Enter FSCSS Command: sh xm214

Device Name       : XM214
Editor Name       : D0279
Creation Date     :  8 Nov 84
Date of Last Use  : 28 Mar 85
Current Uses      : 2
Descriptor        : SAT AMP 100DB
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): y

Amplifier
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 GAIN, DB                          -200.000 TO
                                    200.000                          100.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

Enter FSCSS Command: sh an45

Device Name       : AN45
Editor Name       : D0279
Creation Date     :  8 Nov 84
Date of Last Use  : 28 Mar 85
Current Uses      : 2
Descriptor        : SD ANT GAIN = 25.8
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): y

Antenna
Parameter Name                    Option or Range     Default Value  Current Value
--------------                    ---------------     -------------  -------------
 APPLICATION                       SU,SD,EX,ER,SS                        SD
 ANTENNA TYPE                      AG,EC,MB,PN,SM,
                                   BN                                    AG
 ANTENNA GAIN, DB                  -99.900 TO
                                    99.900                              25.800

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:
```

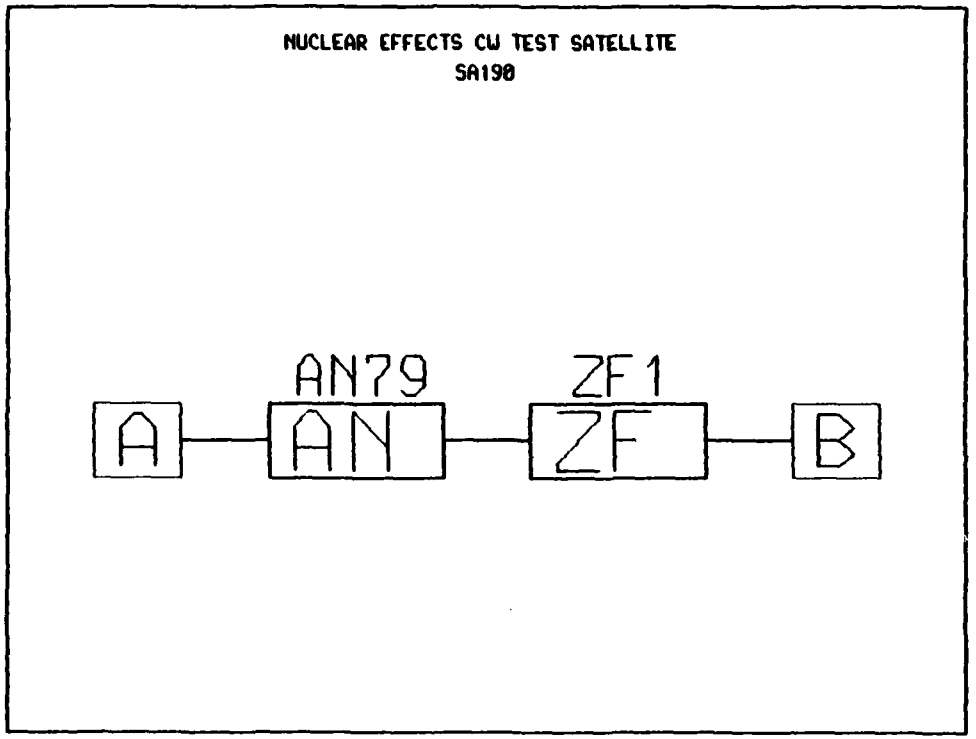
```
SH RV176

Element Name        : RV176
Editor Name         : FSCSS2                ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       :  1 Apr 85
Date of Last Use    :  1 Apr 85             Latitude  :  40 Deg   0 Min  N
Current Uses        : 1                     Longitude : 120 Deg   0 Min  E
Number of Segments  : 1                     Altitude  : 0.152 Kilometers

RV176 Descriptor: AE EFFECTS RV TERM

      Seg   Dev
  #  Code  Count  Devices
  1    AB      5  AN179-LH1-QF103-DD43-ZB1

Enter FSCSS Command: SH AN170

Device Name         : AN179
Editor Name         : D0279
Creation Date       : 18 Dec 84
Date of Last Use    :  1 Apr 85
Current Uses        : 2
Descriptor          : AE TEST RX TERM ANT
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                            ER
 ANTENNA TYPE                   AG,EC,NB,PN,SN,
                                BN,PA                                     AG
 ANTENNA GAIN, DB                    -99.900 TO
                                      99.900                           45.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

```
SH QF103

Device Name       : QF103
Editor Name       : D0917
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : AE TEST DOWN CONV, 10GHZ
####PRIV.DATA: RLPNT: -1
                PFLAG:  1
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Frequency Translator
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 TRANSLATION FREQUENCY, MHZ     -1000000.000 TO
                                 1000000.000                        -9000.000
 OSCILLATOR NOISE MODEL         YE,NO                                NO

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): NN

Enter FSCSS Command: SH DD43

Device Name       : DD43
Editor Name       : D0279
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 2
Descriptor        : 8-FSK,
####PRIV.DATA: RLPNT: -1
                PFLAG:  2
                DVLOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 DEMODULATOR TYPE               BP,DP,QP,OQ,8P,
                                16,FS,MS,CP,AP,
                                PN,FH,PF                              FS
 FREQUENCY, MHZ                     0.001 TO
                                 100000.000                         1000.000
 ALPHABET SIZE                      2,    4,
                                    8,   16                            8
 FREQUENCY SPACING, KHZ             0.001 TO
                                  9999.999                          36.110
 BANDWIDTH-TIMING LOCK LOOP,HZ      0.000 TO
                                 1000000.000                         0.000
 DAMPING FACTOR-TIMING LOOP         0.010 TO
                                     9.990          0.707            0.707
 AGC-TIMING LOCK LOOP           YE,NO                                NO
 LIMITATION AT ZERO DBW         YE,NO                                YE
 DECISION TYPE                  HA,SO                                HA

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):
```

ACCEPTANCE TEST 12


NUCLEAR EFFECTS CU CONFIGURATION
SY23
SA190
SA
XT191
XT
C
TL1
TL
PA8
PA
A


NUCLEAR EFFECTS CW TRANSMIT TERMINAL
XT191
MI46
ZF1
FA243
XM433
ZF1
AN93
A
MI
B
ZF
FA
XM
ZF
AN
C
MI47
D
MI


NUCLEAR EFFECTS CW TEST SATELLITE
SA190
AN79
ZF1
A
AN
ZF
B

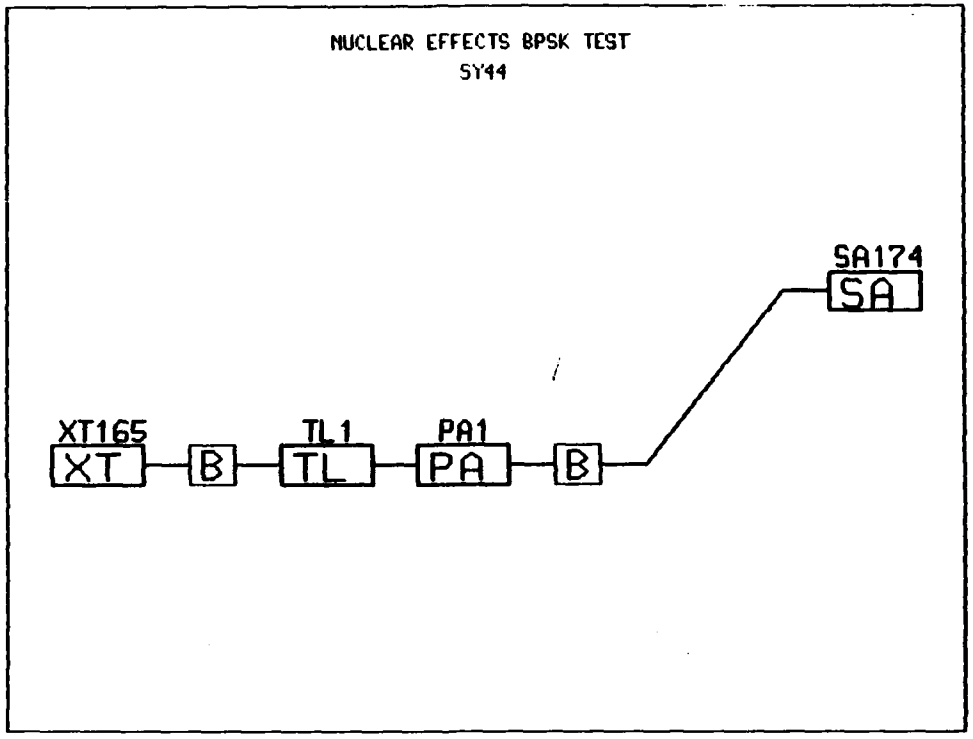
```
Enter FSCSS Command: SH SY23

System Name                : SY23
Editor Name                : FSCSS2          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 5
Creation Date              :  1 Apr 85                      BTPPTR: 547
Date of Last Run/Restart   :  1 Apr 85
# of Transmit Terminals   : 1
# of Receive Terminals    : 0               Linkage Specification    : GE
# of Satellites           : 1               TDMA "Devices"           : (None)
# of Transmission Paths    : 1               Demand Access "Devices" : (None)

SY23 Descriptor: TEST NUKEM.

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT191 SA190  CA   TL1 PA8

Display Associated Device Linkage? (Y/N): Y
No Associated Devices

ZZZZPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT191

Element Name         : XT191
Editor Name          : FSCSS2          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date        :  1 Apr 85
Date of Last Use     :  1 Apr 85       Latitude  :   0 Deg   0 Min  N
Current Uses         : 1               Longitude :   0 Deg   0 Min  E
Number of Segments   : 3               Altitude  : 0.000 Kilometers

XT191 Descriptor: TEST NUKES W.CW

      Seg   Dev
  #  Code  Count  Devices
  1    BC      5  ZF1-FA243-XM433-ZF1-AN93
  2    AB      1  MI46
  3    DB      1  MI47

Enter FSCSS Command: SH SA190

Element Name         : SA190
Editor Name          : FSCSS2          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date        :  1 Apr 85
Date of Last Use     :  1 Apr 85       Latitude  :   0 Deg   0 Min  N
Current Uses         : 1               Longitude :   0 Deg   0 Min  E
Number of Segments   : 1               Altitude  : 35860.000 Kilometers

SA190 Descriptor: TEST NUKEM W.CW

      Seg   Dev
  #  Code  Count  Devices
  1    AB      2  AN79-ZF1

Enter FSCSS Command:
```

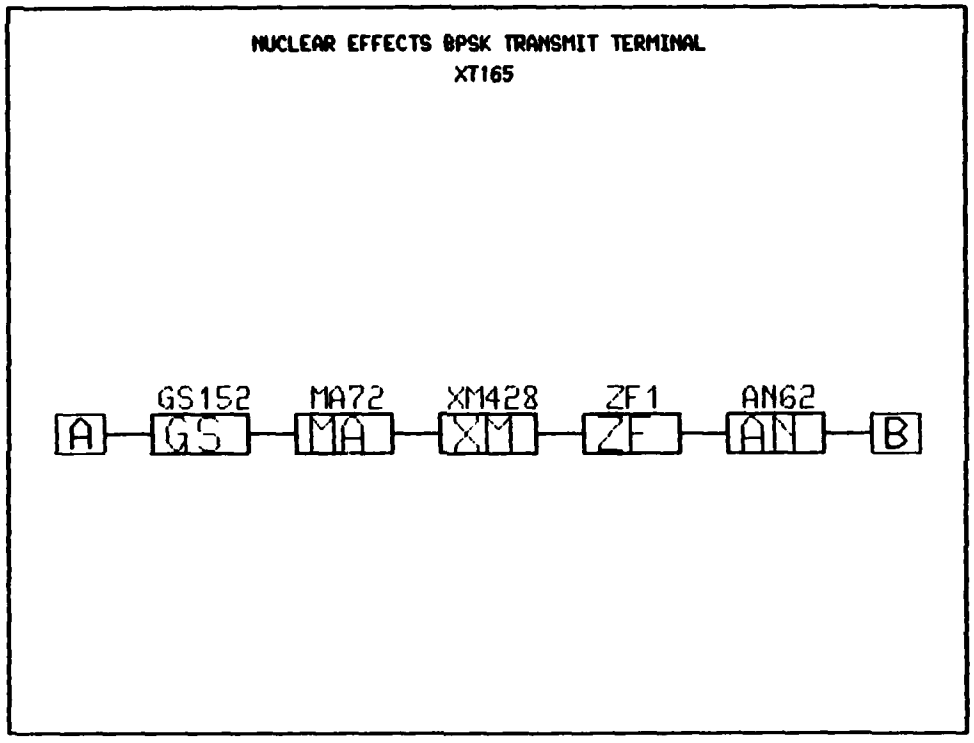
```
SH FA243

Device Name       : FA243
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKEM
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Filter
Parameter Name                 Option or Range   Default Value   Current Value
--------------                 ---------------   -------------   -------------
 FILTER TYPE                   CS,BU,BT,BE,LE,
                               PR,PZ,FS                                   CS
 CENTER FREQUENCY, MHZ               0.001 TO
                               100000.000                           8000.000
 3-DB BANDWIDTH, MHZ                 0.001 TO
                                 999.999                              30.000
 NO. OF POLES                  1 TO      30                               11
 RIPPLE FACTOR, DB                   0.000 TO
                                   3.000                               0.010

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM433

Device Name       : XM433
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKEM
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                 Option or Range   Default Value   Current Value
--------------                 ---------------   -------------   -------------
 GAIN, DB                         -200.000 TO
                                   200.000                            25.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

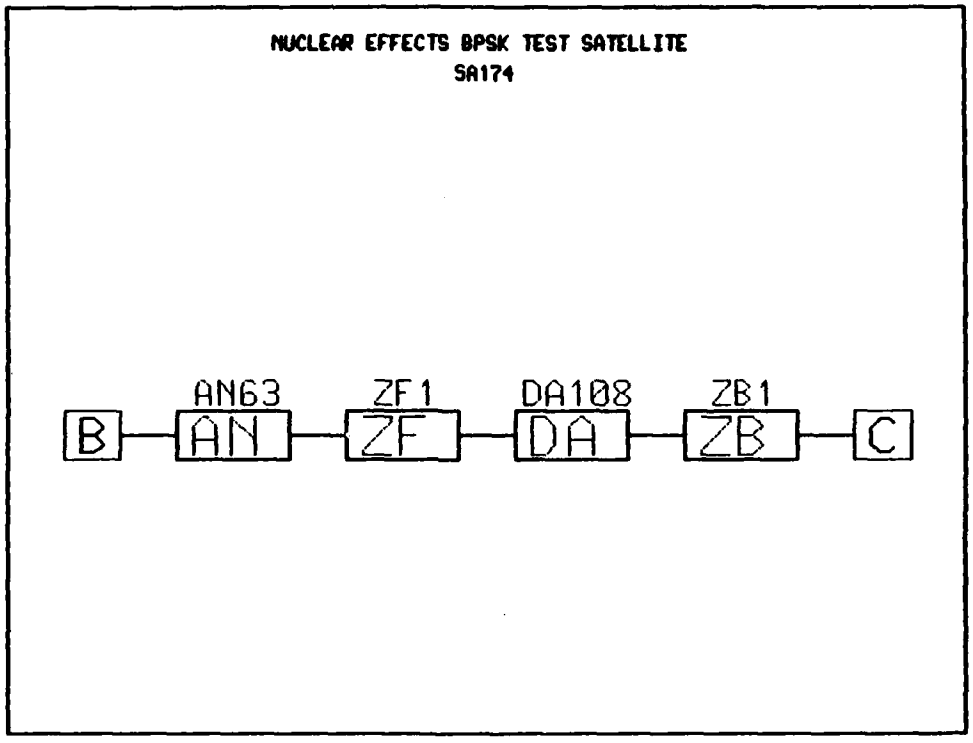
```
Enter FSCSS Command: SH AN93

Device Name       : AN93
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKEM
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                            EX
 ANTENNA TYPE                   AG,EC,NB,PN,SN,
                                BN                                        AG
 ANTENNA GAIN, DB                    -99.900 TO
                                      99.900                           90.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MI46

Device Name       : MI46
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        :
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FH,PF,CU,FM,
                                PU                                        CU
 FREQUENCY, MHZ                       0.001 TO
                                 100000.000                          7999.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
    SH MI47

Device Name       : MI47
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        :
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PN,FH,PF,CW,FM,
                                PU                                        CW
 FREQUENCY, MHZ                    0.001 TO
                                100000.000                            8010.000

####PPIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN79

Device Name       : AN79
Editor Name       : FSCSS2
Creation Date     :  1 Ap. 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKEM
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                            SU
 ANTENNA TYPE                   AG,EC,NB,PN,SN,
                                BN,PA,SA,BA                               AG
 ANTENNA GAIN, DB                 -99.900 TO
                                   99.900                                00.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH TL1

Device Name       : TL1
Editor Name       : FSCSS
Creation Date     : 20 Mar 84
Date of Last Use  : 26 Apr 85
Current Uses      : 11
Descriptor        : FSCSS Permanent Tran Los
####PRIV.DATA: RLPNT: -1
               PFLAG: 11
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Transmission Loss
Parameter Name                    Option or Range          Default Value  Current Value
--------------                    ---------------          -------------  -------------
 TRANSMISSION LOSS, DB            -300.000 TO
                                     0.000                                    0.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH PA8

Device Name       : PA8
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKEM
####PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Propagation Anomalies
Parameter Name                    Option or Range          Default Value  Current Value
--------------                    ---------------          -------------  -------------
 DOPPLER                          YE,NO                                        NO
 SCINTILLATION                    YE,NO                                        NO
 NUCLEAR SCINTILLATION            YE,NO                                        YE
 TOTAL ABSORPTION, DB                0.000 TO
                                    30.000                                    1.000
 SIGNAL DECORRELATION TIME,SEC    1.000000E-04 TO
                                  1.000000E+01                         1.000000E-04
 EST. SIMULATION BANDWIDTH,MHZ       0.001 TO
                                 10000.000                                   30.000
 MAX. SYMBOL RATE, KBITS/SEC         0.010 TO
                                100000.000                                 1000.000
 FREQ. SELECTIVE BANDWIDTH,KHZ       0.100 TO
                                100000.000                                 1000.000
 CIR FUNCTION SEED                       0 TO
                                2147483647                                 10101
 ARBITRARY FLUCTUATION            YE,NO                                        NO
```


NUCLEAR EFFECTS BPSK TEST
SY44
SA174
SA
XT165
XT
B
TL1
TL
PA1
PA
B


NUCLEAR EFFECTS BPSK TRANSMIT TERMINAL
XT165
GS152
MA72
XM428
ZF1
AN62
A
GS
MA
XM
ZF
AN
B


NUCLEAR EFFECTS BPSK TEST SATELLITE
SA174
AN63
ZF1
DA108
ZB1
B
AN
ZF
DA
ZB
C

```
-SY44

System Name                : SY44
Editor Name                : FSCSS2        ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 8
Creation Date              : 28 Mar 85                    BTPPTR: 543
Date of Last Run/Restart   :  1 Apr 85
# of Transmit Terminals   : 1
# of Receive Terminals    : 0             Linkage Specification    : GE
# of Satellites           : 1             TDMA "Devices"           : (None)
# of Transmission Paths    : 1             Demand Access "Devices" : (None)

SY44 Descriptor: TEST NUKE 'EM.

    Xmit  Recv          Transmission
  #  Elem  Elem  Code   Path Devices
  1  XT165 SA174  BB    TL1 PA1

Display Associated Device Linkage? (Y/N): Y

      Orig  Device    Dest  Device
  #   Elem Position   Elem Position
  1   XT165  1AB1     SA174  1BC4
  2   XT165  1AB2     SA174  1BC3

ZZZZPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT165

Element Name        : XT165
Editor Name         : FSCSS2            ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 28 Mar 85
Date of Last Use    :  1 Apr 85         Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                 Longitude :   0 Deg   0 Min  E
Number of Segments : 1                  Altitude  : 0.000 Kilometers

XT165 Descriptor: NUKE EM

      Seg   Dev
  #  Code  Count  Devices
  1    AB      5  GS152-MA72-XM428-ZF1-AN62

Enter FSCSS Command: Y
Unrecognized Command

Enter FSCSS Command: N
Unrecognized Command

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH SA174

Element Name        : SA174
Editor Name         : FSCSS2                ###PRIV.DATA: RLPNT: -1    PFLAG: 1
Creation Date       : 28 Mar 85
Date of Last Use    :  1 Apr 85             Latitude  :   0 Deg   0 Min  N
Current Uses        : 1                     Longitude :   0 Deg   0 Min  E
Number of Segments  : 1                     Altitude  : 35860.000 Kilometers

SA174 Descripter: TEST NUKE 'EM.

     Seg   Dev
  #  Code  Count  Devices
  1    DC      4  AN63-ZF1-DA108-ZD1

Enter FSCSS Command:
```

```
SH GS152

Device Name       : GS152
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 3
Descriptor        : TEST NUKE
****PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                   Option or Range  Default Value  Current Value
--------------                   ---------------  -------------  -------------
 ****PRIV.TEST: SOURCE TYPE      IG,EX,A0,A1                                IG
 DATA RATE,KBPS                          0.001 TO
                                   1000000.000                          10.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA72

Device Name       : MA72
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKE
****PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DULOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                   Option or Range  Default Value  Current Value
--------------                   ---------------  -------------  -------------
 MODULATOR TYPE                  BP,QP,OQ,MS,DP,
                                 8P,16,AP,FS,CP,
                                 PN,FH,PF,CW,FM,
                                 PU                                         BP
 FREQUENCY, MHZ                          0.001 TO
                                    100000.000                        8000.000

****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

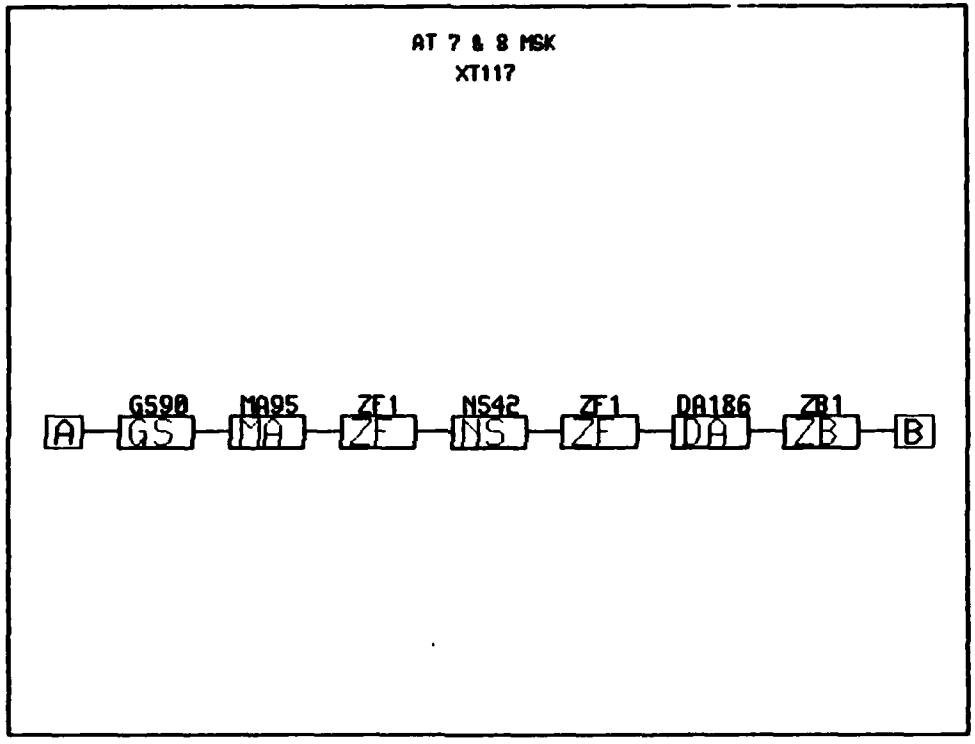
```
XM428

Device Name       : XM428
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 2
Descriptor        : TEST NUKE
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Amplifier
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 GAIN, DB                          -200.000 TO
                                    200.000                          200.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN62

Device Name       : AN62
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 2
Descriptor        : TEST NUKE
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 APPLICATION                       SU,SD,EX,ER,SS                          EX
 ANTENNA TYPE                      AG,EC,NB,PN,SN,
                                   BN                                     AG
 ANTENNA GAIN, DB                  -99.900 TO
                                    99.900                              20.000

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
- TL1                                                    nter FSCSS Command:

Device Name       : TL1
Editor Name       : FSCSS
Creation Date     : 20 Mar 84
Date of Last Use  :  1 Apr 85
Current Uses      : 40
Descriptor        : FSCSS Permanent Tran Los
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG: 40
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Transmission Loss
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 TRANSMISSION LOSS, DB            -300.000 TO
                                     0.000                                0.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH PA1

Device Name       : PA1
Editor Name       : FSCSS2
Creation Date     :  1 Apr 85
Date of Last Use  :  1 Apr 85
Current Uses      : 2
Descriptor        : END
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Propagation Anomalies
Parameter Name                    Option or Range      Default Value  Current Value
--------------                    ---------------      -------------  -------------
 DOPPLER                          YE,NO                                    NO
 SCINTILLATION                    YE,NO                                    NO
 NUCLEAR SCINTILLATION            YE,NO                                    YE
 TOTAL ABSORPTION, DB                 0.000 TO
                                     30.000                               0.100
 SIGNAL DECORRELATION TIME,SEC    1.000000E-04 TO
                                  1.000000E+01                            0.100
 EST. SIMULATION BANDWIDTH,MHZ        0.001 TO
                                  10000.000                               0.001
 MAX. SYMBOL RATE, KBITS/SEC          0.010 TO
                                 100000.000                              10.000
 FREQ. SELECTIVE BANDWIDTH,KHZ        0.100 TO
                                 100000.000                           20000.000
 CIR FUNCTION SEED                        0 TO
                                2147483647                               10101
 ARBITRARY FLUCTUATION            YE,NO                                    NO

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N
```

```
4 AM63

Device Name       : AM63
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Users     : 3
Descriptor        : TEST NUKEM
####PRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Antenna
Parameter Name                  Option or Range  Default Value  Current Value
--------------                  ---------------  -------------  -------------
 APPLICATION                    SU,SD,EX,ER,SS                        SU
 ANTENNA TYPE                   AG,EC,NB,PN,SN,
                                BN,PA,SA,BA                           AG
 ANTENNA GAIN, DB                    -99.900 TO
                                      99.900                        10.000

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
SH DA108

Device Name       : DA108
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  :  1 Apr 85
Current Uses      : 1
Descriptor        : TEST NUKEM
####PRIV.DATA: RLPNT: -1
                 PFLAG:  1
                 DVLOC:   0    0

Display User Parameters? (Y/N): Y

Demodulator
Parameter Name                  Option or Range          Default Value  Current Value
--------------                  ---------------          -------------  -------------
 DEMODULATOR TYPE               BP,DP,QP,OQ,8P,
                                16,FS,MS,CP,AP,
                                PN,FH,PF                                      BP
 FREQUENCY, MHZ                      0.001 TO
                                  100000.000                                8000.000
 TYPE-TIMING LOCK LOOP          DF,PU                                         DF
 BANDWIDTH-TIMING LOCK LOOP,HZ       0.000 TO
                                 1000000.000                                  0.000
 DAMPING FACTOR-TIMING LOOP          0.010 TO
                                     9.990              0.707               0.707
 TYPE-PHASE LOCK LOOP           DF,PU                                         DF
 ORDER-PHASE LOCK LOOP          2 ,3                                          2
 BANDWIDTH-PHASE LOCK LOOP, HZ       0.000 TO
                                  1000000.000                                 0.000
 DAMPING FACTOR-PHASE LOOP           0.010 TO
                                     9.990              0.707               0.707
 AGC-TIMING & PHASE LOCK LOOPS  YE,PL,NO                                      NO
 LIMITATION AT ZERO DBU         YE,NO                                         NO
 MINIMUM SIGNAL LEVEL, DBU        -200.000 TO
                                     0.000                                    0.000
 DECISION TYPE                  HA,SO                                         HA
 DETECTOR TYPE                  ID,FS                                         ID

####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

PHASE II ACCEPTANCE TESTS 7 AND 8 MSK


AT 7 & 8 MSK
XT117
GS90
MA95
ZF1
NS42
ZF1
DA186
ZB1
A
GS
MA
ZF
NS
ZF
DA
ZB
B

```
Enter FSCSS Command: SH SY83

System Name                 : SY83
Editor Name                 : D0922          ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 6
Creation Date               :  4 Mar 85                     BTPPTR: 343
Date of Last Run/Restart    : 28 Mar 85
# of Transmit Terminals     : 1
# of Receive Terminals      : 0              Linkage Specification    : BT
# of Satellites             : 0              TDMA "Devices"           : (None)
# of Transmission Paths      : 1              Demand Access "Devices"  : (None)

SY83 Descriptor: AT 7 & 8 MSK

     Xmit  Recv        Transmission
  #  Elem  Elem  Code  Path Devices
  1  XT117   0    BI   (None)

Display Associated Device Linkage? (Y/N): Y

      Orig  Device   Dest  Device
  #   Elem Position  Elem Position
  1   XT117  1AB1    XT117  1AB7
  2   XT117  1AB2    XT117  1AB6

ZZZZPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT117

Element Name          : XT117
Editor Name           : D0922            ZZZZPRIV.DATA: RLPNT: -1    PFLAG: 2
Creation Date         :  4 Mar 85
Date of Last Use      :  4 Mar 85        Latitude  :   0 Deg   0 Min  N
Current Uses          : 2                Longitude :   0 Deg   0 Min  E
Number of Segments    : 1                Altitude  : 0.000 Kilometers

XT117 Descriptor: AT 7 & 8 MSK

     Seg   Dev
  #  Code  Count  Devices
  1    AB      7  GS90-MA95-ZF1-NS42-ZF1-DA186-ZB1

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH GS90

Device Name       : GS90
Editor Name       : D0922
Creation Date     :  4 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 3
Descriptor        : TEST MSK AT7&8
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  3
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 ZZZZPRIV.TEST: SOURCE TYPE     IG,EX,A0,A1                                 IG
 DATA RATE,KBPS                        0.001 TO
                                 1000000.000                          1000.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA95

Device Name       : MA95
Editor Name       : D0922
Creation Date     :  4 Mar 85
Date of Last Use  :  8 Mar 85
Current Uses      : 2
Descriptor        : TEST 7&8
ZZZZPRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name                  Option or Range      Default Value  Current Value
--------------                  ---------------      -------------  -------------
 MODULATOR TYPE                 BP,QP,OQ,MS,DP,
                                8P,16,AP,FS,CP,
                                PM,FM,PF,CU,FM,
                                PU                                          MS
 FREQUENCY, MHZ                        0.001 TO
                                  100000.000                           100.000

ZZZZPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH NS42

Device Name       : NS42
Editor Name       : D0922
Creation Date     : 28 Mar 85
Date of Last Use  :  4 Mar 85
Current Uses      : 1
Descriptor        : TEST NSK AT SA
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  1
               DVLOC:   0    0

Display User Parameters? (Y/N): Y

Noise Source
Parameter Name                 Option or Range          Default Value  Current Value
--------------                 ---------------          -------------  -------------
 TYPE OF NOISE                 TE,SA                         TE             TE
 EFFECTIVE NOISE TEMP,K        0.000000E+00 TO
                               1.000000E+23                            2.290000E+16

$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

```
Enter FSCSS Command: SH DA18G

Device Name          : DA18G
Editor Name          : D0522
Creation Date        :  8 Mar 85
Date of Last Use     :  8 Mar 85
Current Uses         : 2
Descriptor           : TEST 7
$$$$PRIV.DATA: RLPNT: -1
               PFLAG:  2
               DVLOC:   0    0

Display User Parameters? (Y/N): Y
```

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,QP,OQ,8P, 16,FS,MS,CP,AP, PN,FM,PF		MS
FREQUENCY, MHZ	0.001 TO 100000.000		100.000
TYPE-TIMING LOCK LOOP	DF,PU		DF
BANDWIDTH-TIMING LOCK LOOP,HZ	0.000 TO 1000000.000		0.100
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
TYPE-PHASE LOCK LOOP	DF,PU		DF
ORDER-PHASE LOCK LOOP	2 ,3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		10.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING & PHASE LOCK LOOPS	YE,PL,NO		NO
LIMITATION AT ZERO DBU	YE,NO		NO
MINIMUM SIGNAL LEVEL, DBU	-200.000 TO 0.000		0.000
DECISION TYPE	HA,SO		SO
DETECTOR TYPE	ID,FS		ID

```
$$$$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:
```

END

FILMED

8-85

DTIC