SAU-1900E ALIGNMENT PROCEDURE

The SAU-1900E is a CDMA Digital Cellular Receiver/Transmitter covering the frequency range from 1850-1910 MHz (Transmit) and 1930-1990 MHz (Receive). The system design and infrastructure normally controls the SAU-1900E transmitted power level and frequency within required specifications, however initial alignment is performed to constrain the open-loop output power levels to an acceptable range.

Alignment of the unit is entails loading correction factors into non-volatile memory for setting minimum and maximum transmit power levels and to ensure that open-loop power levels are maintained within the limits specified in IS-98A by entering a table of AGC control settings. This alignment is performed at initial manufacture and after repair or replacement of the RF section or following replacement of the non-volatile memory.

All alignment procedures are performed under software control of the SAU-1900E and specialized CDMA Test Equipment. The equipment required to Align the SAU-1900E and a description of the procedures is provided below:

EQUIPMENT:

a. IBM PC Compatible: '386 or higher chipset running MS-DOS 3.1+ (or equivalent DOS environment running under Windows 3.1/Windows 95). & VGA (or equivalent) monitor.

- w/Keithley Metrabyte KPC-488.2 IEEE-488 Interface Board
- 1ea IEEE-488 Cable (User determined length)
- RS-232 Adapter Cable. (9pin to 9pin cable is typical, although configuration of local PC may require a 25pin-to-9pin cable or use of 9pin-to-25pin adapter).
- SAU-1900E RS232 Interface Adapter (9pin-to-circular din adapter with signal conversion from RS232 levels to TTL levels).

b. CDMA Mobile Test Set (One of the following options):

1. Tektronix (or Rohde&Schwarz) CMD 80 Digital Radio Communication Tester).

Or,

2. Hewlett Packard HP8924C CDMA Mobile Station Test Set

c. SAU-1900E Calibration Software. (Use software applicable to the particular CDMA Mobile Test Set being used):

   1. SAUCAL_T.EXE; Release Version 1.0 {For use with the Tektronix CMD 80}

   OR,

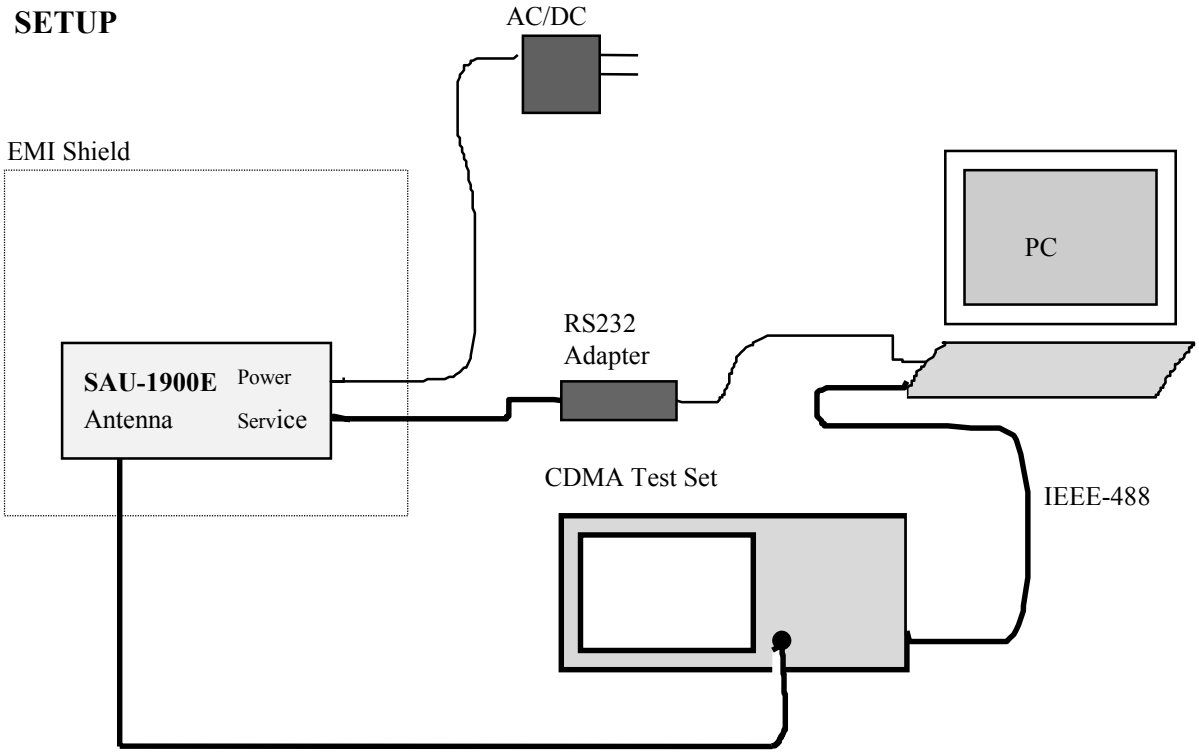
   2. SAUCAL_H.EXE; Release Version 1.0 {For use with the HP8924C}

d. EMI Shielded Enclosure (Optional if testing is performed in a locale where there is no active AMPS stations). The enclosure should provide 50 dB (or greater) attenuation over the TX/RX frequency bands.

e. AC/DC Power Adapter (18-19 Vdc nominal @ 900 mA minimum; 2.1mm I.D. 5.5mm O.D.)

f. Double Shielded Coaxial Cable (Antenna Cable): {Cable loss should be measured prior to testing}.

SETUP



PROCEDURE:

1. Connect equipment per SETUP Diagram shown above.

2. Power up the PC, CDMA Test Set, and SAU-1900E. If necessary, perform any applicable auto-calibration procedures on the CDMA Test Set and let the equipment warm-up per the manufacturer's recommendations.

3. Load and run the applicable calibration software.

4. When the calibration program starts, enter the following data at the screen prompts:

- Prompt: "SELECT LINE PRINTOUT"; select "PRINTER IS OFF"
- Prompt: "PUT OPERATOR CODE"; press <ENTER> with no data then press <ENTER> again to confirm.
- Prompt: "SELECT STOP OR CONTINUE ON FAIL": select "CONTINUE ON FAIL"
- Prompt: "TYPE PRODUCTION NUMBER"; type in unit Serial Number, then press <ENTER> to confirm.

The software will then put the CDMA Test Set into REMOTE operation via the IEEE-488 Bus and will communicate with the SAU-1900E to monitor its performance and to load calibration data. Upon completion of the test, the program will store the test results in file DATA.TXT on the computer hard disk. This file should be copied to a floppy (Labeled with the Serial Number of the SAU-1900E) for future records. A typical report is shown below for reference:

Example DATA.TXT Calibration Report File: {FOR REFERENCE ONLY}

Pass 1 ESN Check C50C0002
Pass 2 SW Version PAMK4
Pass 3 Registration Passed
Pass 4 Minimum Transmit Power Calibration -51.79 dBm
Pass 5 Maximum Transmit Power Check 24.63 dBm
Pass 6 Average RX/TX_AGC value at -106 dBm -26.00 684.00
Pass 7 Average RX/TX_AGC value at -95.4 dBm -16.00 676.00
Pass 8 Average RX/TX_AGC value at -84.7 dBm -1.00 604.00
Pass 9 Average RX/TX_AGC value at -74.1 dBm 14.00 532.00

Pass 10 Average RX/TX_AGC value at -63.4 dBm 31.00 464.00
Pass 11 Average RX/TX_AGC value at -52.8 dBm 48.00 404.00
Pass 12 Average RX/TX_AGC value at -42.1 dBm 63.00 336.00
Pass 13 Average RX/TX_AGC value at -31.5 dBm 77.00 272.00
Pass 14 Average RX/TX_AGC value at -20.8 dBm 83.00 216.00
Pass 15 CDMA CALIBRATION CHECK @ - 65 dBm -9.85 dBm
Pass 16 Maximum Transmit Power Calibration 23.71 dBm
Pass 17 Minimum Transmit Power Check -51.72 dBm
Pass 18 RX Offset $66
Pass 19 TX Offset $8A
Pass 20 Tx 0,0,8,9,9,9,9,9,9,9,9,9,9,9,9,8,9,8,8
Pass 21, 7,8,7,9,8,9,8,8,8,8,9,18,19,19,19,0,0
Pass 22 Rx 5,5,7,8,7,8,8,9,8,9,7,8,7,7,3,3
Pass 23 Max Power Value: $99 (153)
Pass 24 Min Power Value: $89 (137)
Pass 25 Failed Test's:
Pass 26 Program Run Time

5. Alignment is complete after successful termination of this programs (No Fails).